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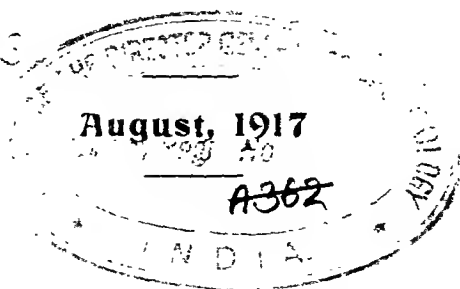
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Diet, Nutrition and Excretion of the Asiatic Races in Singapore.

No. 1, Medical Students.

BY J. ARGYLL CAMPBELL.

Introduction.

This research was undertaken in order to supply the local medical students with necessary information. Up to a short time ago the physiology of diet, nutrition and excretion which was placed before these students, was that of an European. The facts and figures which hold for an European are far from the truth when applied to an Asiatic. The results published in this paper have been obtained during the six months from October, 1916, to March, 1917, and although they are not considered to be more than an introduction to the subject they do form a basis to work upon when dealing with local Asiatic patients, whereas the European figures are certainly misleading. It is the intention of the author to continue this research for an indefinite period employing representatives of all classes and of all races of the community. These results apply to individuals leading sedentary lives similar to that of a medical student.

Technique.

There are Tamils, Malays, Chinese, Brahmins and Eurasians at the Medical School. One Tamil, one Chinese, and one Brahmin representative have been under observation every Monday, Wednesday and Friday for six months. A Malay has been employed for only two weeks. He partakes of the same diet as the Tamil. His results although few in number are interesting in that they confirm the results obtained from the Tamil. Results obtained at random from many other medical students confirm the results obtained from the students who have been under observation for six months.

The Tamil and Malay representatives live in the school hostel. The Chinese and the Brahmin live in their own homes. The Chinese, Brahmin and Tamil are senior students and rank amongst the most successful at the school. They have been demonstrators and class assistants for over a year. The author is indebted to them for their faithful co-operation.

In all cases the food eaten is that of the student's choice. The daily diet varies slightly in quality. It does vary considerably in quantity. The food was weighed just before it was eaten. The compositions of the foods and their heat values have been taken from standard books on the subject (1).

For estimations of the kidney excretions care was taken to preserve the twenty-four hour specimens by the addition of 2 c.c. of a 5 per cent. solution of Thymol in chloroform. This is a matter of importance to doctors in Malaya. Ammoniacal fermentation proceeds very rapidly in this climate if the preservative is not added. The methods of quantitative analyses employed are those described by Cramer (2). Some of these methods are not as accurate as they might be, but they are employed in most hospitals because the results obtained are quite accurate enough from a clinical point of view.

On one or two occasions one or other of the representatives was indisposed for a day or two. No observations were made until health was restored.

Diet and Nutrition.

Chinese.—The maximum diet taken by the Chinese in twenty-four hours gives a heat value of 2131 kilocalories. It consists of bread 45 grammes, condensed milk 42, boiled rice 798, flour 128, pork 37, chicken 32, fish 50, cabbage 10, bananas 112. His minimum diet for twenty-four hours gives a heat value of 1141 kilocalories. It consists of boiled rice 524 grammes, egg 40, pork 37, beans 14, chicken 51, flour 53, fish 21, cabbage 14, gruel 65. His average diet for six months consists of protein 60 grammes, fat 14, carbohydrate 227, which gives 1577 kilocalories (Table II). This student weighs 92 lbs. and is 20 years of age. He has lost a small amount of weight during the experiment. Examination of his kidney excretion shows that he metabolises 57.8 grammes of the protein eaten, so that he uses most of the food he eats.

Tamil.—The maximum diet taken by the Tamil in 24 hours gives 1847 kilocalories, his minimum diet 1519. The former consists of bread 116 grammes, butter 14, bananas 112, cake 112, cocoa 14, beef 21, mutton 98, boiled rice 448, egg 20, sugar 11. The minimum diet consists of bread 120 grammes, butter 6, bananas 67, fish 118, beans 154, boiled rice 504, cake 56, eggs 90, sugar 14, cocoa 14. This student lived on this diet for six months, but estimations were made during three months of this period. The average diet for the three months gives 1672 kilocalories and contains 58 grammes of protein, 32 of fat and 277 of carbohydrate (Table II). The examination of his kidney excretion shows that he metabolises 51.5 grammes of protein, so that he does not use all of the food he eats. He is 26 years of age and weighs 143 lbs.

Malay.—This student partook of the same diet as the Tamil for six months. He has only been under observation for two weeks.

His average diet for this period contains 57 grammes of protein, 31 of fat and 239 of carbohydrate, the heat value being 1502 kilocalories (Table II). His kidney excretion shows that he metabolises 50 grammes of the protein of his food. He weighs 125 lbs. and is 18 years of age. His religion does not allow him to eat pork otherwise he has a free choice.

Brahmin.—The maximum diet taken by this student gives 2922 kilocalories, the minimum 2175. The maximum diet consists of wheat 96 grammes, lentils 107, rice (weighed uncooked) 350, butter 76, sugar 14, milk 448; the minimum diet consists of wheat 63 grammes, onions 49, butter 90, beans 126, lentils 140, rice 198, sugar 14, milk 336. The average diet contains 83 grammes of protein, 68 of fat and 371 of carbohydrate (Table II). Judging from his kidney excretion this student metabolises only half of his protein food, namely 41.5 grammes. The other half is simply wasted. It is well known that many vegetarians partake of such bulky and indigestible foods that absorption is interfered with. This student is a strict vegetarian: Brahmins are not allowed to take any animal food except milk. His average daily diet has a heat value of 2193 (Table II) but it is evident that he uses a good deal less than this since only half of the protein food is actually used by his body. He weighs 110 lbs. and is 21 years of age. He has not altered appreciably in weight during the six months of observation.

Kidney Excretions.

Ammonia.—The total acidity of the urine cannot be accurately determined, but if the urine be neutralised by adding \sum_{10} alkali, some indication can be obtained regarding the acidity. Since the figure thus obtained is of no known clinical importance no more need be said about it. After neutralising the urine as above, neutral formaldehyde is added. Owing to the liberation of acid which takes place when the formaldehyde has combined with ammonia, the urine acquires again an acid reaction. This second acidity is titrated again with \sum_{10} alkali and this second titration is a measure of the amount of ammonia present. The average quantity of ammonia excreted by the Chinese is .61 gramme, by the Tamil .63, by the Malay .66 and by the Brahmin .57. An European excretes about .7 gramme (Table I). The smaller quantity of ammonia excreted by the Asiatic is due to the fact that he eats a larger proportion of vegetables than the European. Vegetable foods are very rich in bases which unite with the acids of the blood and thus a smaller quantity of ammonia is required from the tissues in order to keep the blood alkaline. Ammonia formation is the physiological remedy for deficiency of bases and is excessive in certain diseases, *e.g.*, acidosis.

Chloride.—This is estimated by Volhard's method in which all the chlorides are precipitated with an excess of standard silver

TABLE I. KIDNEY EXCRETIONS (Average figures).

Subject.	Period of observation.	Ammonia.	Chloride.	Urea.	Total Nitrogen.	Ammonia Coefficient.	Amount.	Specific Gravity.
Chinese in Singapore	6 months	.61 gm.	5.27 gm.	16.00 gm.	9.25 gm.	5.17	1273 c.c.	1012
Tamil in Singapore	6 months	.63 "	5.21 "	11.11 "	8.21 "	6.3 "	1629 "	1009
Malay in Singapore	2 weeks	.66 "	8.00 "	13.35 "	8.00 "	6.8 "	1335 "	1010
Brahmin in Singapore	6 months	.57 "	6.34 "	11.08 "	6.61 "	7.1 "	1396 "	1014
European in Europe (S)	....	.70 "	11.00 "	35.00 "	16.00 "	3.6 "	1500 "	1015
European in Singapore	1 week	1.06 "	8.10 "	25.00 "	15.30 "	5.6 "	1560 "	1012

nitrate; the excess of silver nitrate used is determined by adding standard solution of ammonium sulphocyanate in the presence of a ferric salt. The Chinese excretes 5.27 grammes, the Tamil 5.21, the Malay 8 and the Brahmin 6.34. An European excretes about 11 (Table I). On experimental diets individuals have been kept in good conditions when the total content in sodium chloride is reduced to 1 or 2 grammes per diem. Bunge has called attention to the fact that among men and animals the desire for salt is limited for the most part at least to those that use vegetable food. The potassium salts of the vegetable food react with the sodium chloride forming potassium chloride and a sodium salt, both of which would be excreted by the kidney. The blood will thereby lose some of its supply of sodium chloride, whence the craving for more in the food (3).

Urea.—The method employed calculates the amount of urea by measuring the amount of nitrogen liberated from the urine by sodium hypobromite. Dumas-Heniz ureometer is employed. This method only gives approximate results. The Chinese excretes 16 grammes per diem, the Tamil 11.11, the Malay 13.35, the Brahmin 11.08 whereas the average figure for an European is 35 (Table I). It is well known that the amount of urea depends upon the amount of protein absorbed so that the greater the quantity of absorbable protein in the diet the greater the quantity of urea in the urine. About 80% of the total nitrogen in the urine is excreted in the form of urea.

Total Nitrogen.—This is estimated by Kjeldahl's method. The Chinese excretes 9.25 grammes per diem, the Tamil 8.24, the Malay 8.0, the Brahmin 6.64, the European figure being 16 (Table I). It is considered accurate to take the nitrogen excretion as an indicator of the amount of protein actually metabolised or used by the body in performing its work. Since nitrogen forms about 16% of protein, the amount of nitrogen excreted multiplied by 6.25 gives the amount of protein metabolised. The figures thus obtained are 57.8 grammes of protein for the Chinese, 51.5 for the Tamil, 50 for the Malay, 41.5 for the Brahmin and 100 for the European. We have seen that the Brahmin eats a good deal more protein than the other Asiatics (Table II), nevertheless he uses a smaller amount in metabolism, so that evidently a smaller proportion of the protein of his food is absorbed. This is due to its bulk and its indigestibility.

Ammonia Coefficient.—This is the amount of nitrogen, excreted as ammonia, expressed in terms of percentage of the total nitrogen. In an European it is 3.6%, in the Chinese student 5.1%, in the Tamil 6.3%, in the Malay 6.8%, and in the Brahmin 7.1% (Table I). It is higher in the Asiatics than in the European because the protein intake is greatly reduced in the Asiatics so that there is a low total nitrogen excretion. Of the Asiatics the Brahmin has the highest coefficient because he excretes the smallest

TABLE II. DIET AND METABOLISM (Average figures).

Subject.	Diet.	Period of observation.	Weight.	Protein in food.	Protein from Nitrogen in urine.	Fat in Food.	Carbohydrate in food.	Kilocalories in food.
Chinese in Singapore	mixed	6 months	92 lbs.	60 gm.	57.8 gm.	43 gm.	227 gm.	1577
Tamil in Singapore	"	3 "	113 "	58 "	51.5 "	32 "	224 "	1672
Malay in Singapore	"	2 weeks	125 "	57 "	50 "	31 "	239 "	1502
Brahmin in Singapore	vegetable	6 months	140 "	83 "	11.5 "	68 "	374 "	2493
European (Ranko)	mixed	....	160 "	100 "	100.0 "	100 "	240 "	2324
Bengali (McCay)	mainly vegetable	....	115 "	67 "	....	72 "	549 "	3196
Anglo-Indian (McCay)	mixed	....	"	95 "	....	56 "	467 "	2826
Filipino (Aron)	"	....	115 lbs.	75 "	75 gm.	25 "	510 "	2632

amount of nitrogen, whereas the Chinese has the lowest coefficient because he excretes the largest amount of nitrogen.

Other Researches in the Tropics.

I am able to compare my results with those of two other observers. McCay has worked on the diet and nutrition of students in Bengal. He has found that the Bengali students take a smaller proportion of protein food than the Anglo-Indian students who are attending the same college. In opposition to Chittenden's views he attributes the better physique and greater muscular energy of the Anglo-Indian students to this fact. The Bengali student, who averages 115 lbs. in weight eats 67 grammes of protein, only a small quantity of which is obtained from animal sources, 72 of fat and 549 of carbohydrate. This diet has a heat value of 3196 kilocalories. The Anglo-Indian student eats 95 grammes of protein, a big proportion of which comes from animal sources, 56 of fat and 467 of carbohydrate. Although the Bengali eats a smaller amount of protein than the European, he is quite susceptible to kidney troubles (4). One is not justified in concluding that excess of protein is not harmful to the kidney, because there may be reasons to explain the kidney disease in the Bengali which are at present unknown. It is quite evident to physicians that the larger the amount of waste substance to be excreted by the kidney the more is the kidney taxed. In treating kidney disease there is no doubt that cutting down the protein excretion eases the kidney.

Aron (5) has made observations on Filipino students, with an average weight of about 115 lbs. They require 75 grammes of protein, 25 of fat and 516 of carbohydrate. This diet gives 2632 kilocalories (Table II).

Commentary.

As far as my experiments go they show that the medical students of Singapore require less food than the students of Bengal and the Philippines (Table II). Probably this is due to the climates. In Singapore, Calcutta and Manila, the students wear the same tropical clothes, at least during the hot seasons. Therefore we can exclude the influence of clothes. Singapore has practically no seasonal change throughout the whole year; the temperature varies only slightly, the mean being 80° F. At Manila in the Philippines there is some seasonal change, the months of November, December, January and February having a temperate climate. Bengal enjoys a winter. Again the humidity of the atmosphere is greater in Singapore than in Manila and much greater than in Calcutta. The climatic conditions in Singapore, therefore, are more likely to prevent the body losing heat, so that less food is required to keep up the body heat. The average weight in all three cases is about the same. The Singapore students do not take much muscular exercise. This is another probable cause of their small

diet and it may be due to the climatic conditions. Europeans are not inclined to take much exercise in the Tropics but they all do so, because it is not possible to keep healthy on an European diet without regular exercise. The writer has made observations (Table I) upon his own kidney excretion, the results showing that he partakes of a diet similar to that taken by him in Scotland. He takes a good deal more exercise in Singapore than he did in Scotland, although he always took an active interest in out-door games in the latter country. Sir Patrick Manson and others have indicated that even in the case of Europeans who do take active exercise, a diet of moderate quantity is necessary to maintain health in the Tropics, if long residence is contemplated. An excess of food materials throws too much work on the excretory organs and owing to the usual free diaphoresis, the fluids taken are insufficient to flush the kidneys properly, or to secure adequate excretion of the solid products by that channel. This inadequate excretion will in time injure all the organs (6). The smaller amount of food taken by the Singapore student may be nature's way of counter-acting the evil effects of the climate.

Judging from McCay's research the physique and the muscular energy deteriorate on a small amount of protein. Therefore good physique and great muscular energy are incompatible with prolonged residence in a climate like that of Singapore. By prolonged residence is meant a generation or more.

Although the Singapore students who have been under observation do not possess the muscular energy of an European student, they have done quite as much brain work as the average European student. The author has had nine years experience with European students and four years experience with Singapore students. It has been shown that brain work does not require extra food; in other words, a lazy student is just as expensive to feed as an hard working student. A man doing hard mental work in Atwater's respiration chamber gave the same results as when he was resting. Intellectual work has not been found to have any demonstrable quantitative or qualitative effect upon the metabolism of man (7).

Ranke's standard diet for an European living a sedentary life in Europe is appended (Table II) for purposes of comparison.

The figures obtained by examination of the Asiatic student's kidney excretions can be explained by the fact that the Asiatic eats a smaller amount of nitrogenous or protein food than the European. It is not likely that these figures will differ very greatly in the hard working Asiatic coolie, because the coolie does not eat much more protein than the student, but he increases the carbohydrate content of his diet.

Conclusions.

1. The results obtained from examination of the kidney excretion of local students indicate that the European figures are of no value when dealing with Asiatic patients.

2. The total nitrogen varies from 6.64 grammes in the Brahmin to 9.25 in the Chinese.

3. The urea varies from 11.08 grammes in the Brahmin to 16.00 in the Chinese.

4. The ammonia varies from .57 gramme in the Brahmin to .66 in the Malay.

5. The ammonia coefficient varies from 5.4% in the Chinese to 7.1 in the Brahmin.

6. The chlorides vary from 5.2 grammes in the Tamil to 8 in the Malay.

7. The Singapore student partakes of a smaller amount of food than the Philippine or Bengali student. This seems to be due directly or indirectly to the climatic conditions of Singapore.

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Hindustani Loan-Words in Malay.

BY R. O. WINSTEDT.

In a brochure published in 1902 and entitled *Hommage au Congrès des Orientalistes de Hanoi de la part du Bataviaasch Genootschap van Kunsten en Wetenschappen* there appears an article by Dr. Ph. S. van Ronkel on the Hindustani element in the Malay language, which escaped my notice when I compiled my "Malay Grammar" and "English-Malay Dictionary." As the brochure is likely to come into the hands of few English readers, I propose here to extract a list of words, for which Dr. van Ronkel finds a Hindustani derivation.

ACHITA 'very fine white rice.' Probably the Hind. *achchhat* 'whole, unmilled rice, used in religious offerings.' Perhaps the Sanskrit *akṣyata* 'unmilled.'

ARTAL, HARTAL 'a yellow orpiment.' Hind. *hartāl* (from Sanskrit *haritāṭa*).

AKAS, ANGKAS 'the firmament.' Hind. *ākās* (Sk. *ākāśa*).

UNTA 'camel.' Hind. *unt*.

BAI, in Batavia pronounced as BE, a title addressed to Muhammadan Bengalis. Hind. *bhā'ī* 'brother.'

BANDAILARI 'chief treasurer.' Hind. *bhândāri* (Sk. *bhândâgârîka*).

BETI 'woman of the court.' Hind. *bēti* 'girl.'

CHAP 'seal.' Hind. *châp*.

CHURI 'steal. Hind. *chori*. CHURI-CHURI 'by stealth.' Hind. *chori-chori*.

CHUKA 'vinegar.' Hind. *chûk*; not directly from Sk. *cukra*.

CHULIM, CHILAM 'a fill of opium, in an opium-pipe.' Hind. *chilam* 'that part of the body of a hookah which contains the tobacco and the flame.'

PELANGKING 'palanquin.' This is a word invented in its present form by the Portuguese. There is a Sk. word *pariyanka*, or *pariyanka* 'a bed,' from which we have Tamil and Telugu *palakkou* and Hind. *patkhî*.

KAPAS 'cotton.' A debased or 'pracritised' form of the Sk. *kapāsa*. Possibly identical with the Hind. *kapās*.

KANJI 'rice broth.' Hind. *kāñjī* (Sk. *kāñjika*).

KUNCHI 'key, lock.' The Deccan form of the word is *kunchi*; the Hind. *kunji*, the Sk. *kuñjikā*.

KULI 'paid labourer.' The Hind. is *kūli* and *kuli* but the word may be of Dravidian origin; connected with the Tamil *kūli* 'hire.'

GUDANG 'store.' There is a Hind. word *godān*, [which may be derived from the Anglo-Indian 'godown.' Probably 'Hobson-Jobson' is right in deriving it ultimately from the Dravidian: Telugu *godāni*, Tamil *kicāni* 'a place where goods lie' from *kūdu* 'lie.']

MUTI 'pearl' is not the Tamil *muttu* but the Hindustani *muti*.

Wilkinson's Dictionary has identified already BELI, CHAP, DOM, RAKAT, ROTI, GHI as Hindustani.

LAGAM 'bit of a horse,' which I give as Hindustani in my "Grammar," is a Hindustani loan-word in Persian, and perhaps has been borrowed by Malay from the Persian.

Brandstetter's Indonesian Linguistics.

Translated by C. O. Blagden¹.

REVIEWED BY R. O. WINSTEDT.

In Malacca in the year 1825, on his mother's side from the well-known family of Neubronner, there was born van der Tuuk, who wrought a Copernican change in the study of Malay comparative philology. Malacca has been the mother of much important Malay literature, of the *Sijarah Melayu*, the *Hang Tuah*, and the works of Munshi Abdullah; and then it was the birth-place of this great 'Indolog' van der Tuuk, who has gone without honour in his own place but found it in the pages of the "Encyclopaedia of the Netherlands Indies." We do not enshrine the careers of our students of Malay in an encyclopaedia: so, I should like to record here, that it was four years at Jasin, which inspired Mr. Blagden with his enthusiasm for Malay linguistics and so led to his translating the work under review.

This translation of Brandstetter's essays was badly wanted. Even to-day, how many British students of Malay are aware of the Copernican change wrought by van der Tuuk in Malayan philology? How many readers of this journal realize that Crawford's theories on the subject are no whit more valuable than his dictum to a learned society in Great Britain that whatever else Australia might produce, it could never breed sheep! How many admirers of the "Journal of the Indian Archipelago" know that Logan's Tibeto-Annam synthesis is no more fruitful or valid than that of Anglo-Israelites who find in the British the lost tribes of Israel! How many of us have appraised speculations on the syllable *bu*, *bun*, or *bung* in "words conveying an idea of roundness," to be as idle and valueless for scientific philology as Malay surmises that 'Sumatra' is derived from *sémul raya* or *sama utara*!

Maxwell printed his excellent "Manual of the Malay Language" in the early '80s; his introduction need not have been defaced by obsolete and untenable views, if he had read van der Tuuk's "Outlines of a Grammar of the Malagasy Language" printed in the "Journal of the Royal Asiatic Society of Great Britain" in 1865 (and reprinted in "Essays relating to Indo-China" in 1887.) That essay should have been a *point de repère* for English students of Malay philology as it has been for Dutch.

¹ 'An Introduction to Indonesian Linguistics' being four essays by Reinward Brandstetter, Ph.D., translated by C. O. Blagden, M.A., M.R.A.S.: published by the Royal Asiatic Society, London (7s. 6d.).

In Holland the scientific study of Malayan philology was continued forthwith by Kern, Niemann, Brandes and others. No Englishman pursued the subject further; no Englishman read what the Dutch were doing; in the English language there has been no advance, no further *point de repère* till Mr. Blagden gives us now in English the cream of the philological work of Dr. Brandstetter, a brilliant Swiss scholar of the school of van der Tuuk and Kern.

The name and work of Brandstetter are not unknown to members of our branch Society. Mr. Blagden gave us an appreciation of his earlier work in *Journal* XLII, but since then Brandstetter has made great strides.

The present translation has been termed "An Introduction to Indonesian Linguistics." So vague has been the use of the word 'Indonesian' by British scholars, that it is well to define its meaning. For anthropologists, 'Indonesian' denotes a particular physical strain; for the student of language, it denotes the western division of the great Austronesian (or Malayo-Polynesian or Oceanic) family of speech, the division which irrespectively of racial elements is spoken by the inhabitants of the Philippines, the Malay Archipelago, the Malay Peninsula, the Mergu Archipelago and parts of Indo-China and of Formosa. 'Indonesian' is a term preferable to 'Malayan,' because Achinese or Javanese or Tagalog are no more Malay than Spanish is Italian. Mr. Blagden points out how "Malay in many ways is not a very typical member of the family: its grammar has been much worn down and simplified; and for various other reasons it is unfortunate that so many people are tempted to survey the whole Indonesian field, with its luxuriant diversity, through the rather distorting lens of a knowledge of Malay alone. There has been a very widespread tendency among Malay scholars to regard Malay as the standard or norm of the Indonesian family and to attempt to explain the differences which they noticed in the other languages as deviations from that standard; and that is very far from being the true view."

Of late years, the great Austronesian family has been linked definitively with an Austroasiatic family, which embraces a number of the languages of India and Indo-China, such as Munda, Khasi, Mon Khmer, Nicobarese and Sakai. Kern has shown how Indo-China was probably the point whence the proto-Malay descended on the Archipelago. When French research in Cambodia has progressed even further than it has to-day, when we have fuller dictionaries of Munda and Khasi and conversations recorded in Sakai and when Mr. Blagden has published his work on Taliang (or Mon or Peguan) inscriptions—perhaps some day the synthesis between the two great families may be worked out in detail. Meanwhile Brandstetter finds more than enough material awaiting study in the Indonesian section of the one family.

Four of Brandstetter's best essays are included in the present volume, and Mr. Blagden has supplied cross-references, where the subject matter overlaps.

"Root and Word in the Indonesian Languages" is the first essay. It deals with the extraction of roots from stem-words, which are normally dissyllabic in Indonesian languages; and it describes the morphological process by which stem-words have been constructed by means of formative syllables, usually prefixes, sometimes infixes more rarely suffixes,—formatives which cannot become roots themselves. Compare a series of stem-words and we find often a common syllable running through them, as *lok* through *tēlok*, *kēlok*, *jēlok*, *pēlok*; it may be interred that all those dissyllabic words are constructed from *lok*. Maxwell surmised that in *handkap* we have the Sakai *long* 'hand.' It is not absolutely impossible, considering that a few Indonesian stem-words are built up by the juxtaposition of two roots. But it is exceedingly improbable and far-fetched; compare *chēkap*, *tēkap*, *tērkap*, *langkap*, *rangkap*, *chakap*, *chikup*, *tēkup*, *sērīkup*, *langkup*; we have the common syllables *kap*, *kup* and, as a matter of fact, *t* and *ch* will be found to be common Indonesian prefixes and *ng* a common Indonesian infix. The comparative method throws light, where the study of Malay alone would lead nowhere; it shows for example how *sēsāl*, *sēsap*, *tētup*, *sēsak* are instances of reduplication of roots and appear in Madurese as *sēsāl*, *sēpsēp*, *tēptēp*, *sēkēk*; and again how *dē-* is a common Indonesian formative making word-bases from interjections. Among the roots that can serve as word-bases, Brandstetter detects onomatopoeic interjections, other interjections, baby words, forms of address, monosyllabic prepositions and pronouns. He uses the comparative method with strict adherence to phonetic laws—a principle our smatterers in Malay philology have always failed to observe.

The second essay deals with "Common Indonesian and Original Indonesian" mainly from the point of view of phonetics and grammar. If a word or formative is found throughout the Indonesian area or in two or three widely distant parts of that area, then it must be regarded as common and primitive. Crawford's notion of Malay and Javanese influencing a number of tongues originally unconnected is exploded for ever. The essay is extraordinarily suggestive and does much to solve the vexed problems of Malay formatives, verbal substantival and adjectival. Incidentally Brandstetter shows how there were more monosyllabic words in the original language than are now in use and how the grammatical system was fuller than it is, for example, in modern Malay. And here I should like to invite attention to the nicer nuances of the formatives in old Malay literature like the *Sējajah Mēlayu* and the *Sērī Rama*, where later authors display carelessness or ignorance. How many modern writers could be trusted to write *jika ia bērbuang kuku*, "if he cut his nails."

The "Indonesian Verb," the third essay in this volume, does still more to explain the nature of the verb and its formatives. The importance of the subject for students of Malay will be obvious to all who have struggled with de Hollander's 'subjective-passive'

theory or been amazed at Ophuijsen's attempt to discover conjugation in Malay and to explain the *di* in *di-makan-nut* as a contraction of *diu'*. Brandstetter shows that some at least of the verbal formatives appear to have been once separate parts of speech, notably prepositions and articles. To prove how wide-based are his theories it is only necessary to point out that the following languages were selected as a basis for the study which resulted in this essay:—

Philippines: 1 Bontoc—2 Tagalog.

Celebes: 3 Tontemboan—4 Barepe—5 Macassar—6 Bugis.

Borneo: 7 Dayak—8 Basa Sangiang.

Java: 9 Old Javanese—10 Modern Javanese.

Islands towards New Guinea: 11 Kamberese—12 Kupangese—
13 Rotinese—14 Masaretese.

Sumatra: 15 Minangkaban—16 Toba—17 Karo—18 Gayo—
19 Achinese.

Islands at the back of Sumatra: 20 Mentaway—21 Nias.

Malay Peninsula: 22 Malay.

Madagascar: 23 Hova—24 Old Malagasy.

Essay IV was published in 1915 and deals with the "Phonetic Phenomena in the Indonesian Languages." Perhaps it is the most epoch-making of the essays in this volume: with its clear summary of the phonetic laws of the simple sounds of the Indonesian languages, its delineation of the *pipet* law, the R. G. H. law, the *hamzah* law, the law of the *median*, the diphthongs and aspirates and their laws. It is useless to try to abbreviate in a review an essay so packed with important matter. If ever an attempt is made to produce a comparative dictionary of an Indonesian language, the lexicographer will need to have this essay by heart.

It is to be hoped that Dr. Brandstetter will continue to write essays on the Indonesian languages of the quality of those in this volume: that Mr. Blagden will find time to translate them, and our parent Society the will to print them.

Even for those of us whose interest hardly extends beyond colloquial Malay, this volume should prove stimulating and illuminating. He also serves the cause of Malay studies who buys the few works that are written on the subject: and the present volume is infinitely the most important that has ever appeared in English on Malay philology.

Foliated Pattern in Malay Carving and Silverwork.

BY R. O. WINSTEDT.

On p. 48 of my paper on "Malay Industries, Part I," "Arts and Crafts" (Kuala Lumpur, 1909), I wrote of Malay *repoussé* work. "It owes many of its patterns to Indian influence—the conventional lotus flower, the leaf of the sacred fig and so on—but there is not a technical term that is foreign for metal (gold and silver) tool or pattern, so that there would seem to be no reason why it should be inferred to be Indian in origin. Indeed it must be something more than coincidence that foliated pattern of the same chaste restraint and conventional character is the note of Malay wood-carving."

After a visit last year to the famous Bara-bodor in Java, I am persuaded that it is due to "something more than coincidence" that Malay and Javanese carvings and silverwork have their chaste foliated patterns:—namely, to Indian influence. The foliation carved between the panels illustrating the life of the Buddha on that wonderful memorial is identical with the foliation loved by the Malay craftsman, *e.g.* the so-called 'pine-apple' or 'side view of the lotus' pattern. This can be seen clearly, too, on some of the picture-postcards sold of the Bara-bodor. It would be interesting to know if there are similar foliated patterns on the ruins of Angkor Wat?

Contributions to our Knowledge of the Flora of Borneo.

BY E. D. MERRILL.

Botanist, Bureau of Science, Manila, P. I.

In a previous paper on the Bornean flora* I briefly indicated the striking differences between the relationships of the Philippine-Moluccan floras on the one hand, and the Philippine-Bornean floras on the other hand, describing forty-eight new species of Bornean plants and one new genus, and crediting a number of other species previously described by other authors to Borneo. The present paper is in the nature of a continuation of the first one published; and in it I have described thirty-nine new species and credited about twenty-five additional ones to Borneo for the first time. The types of the new species proposed are preserved in the herbarium of the Bureau of Science, Manila, P. I.

In the present paper new species are described in the following families: *Gramineae*, *Cyperaceae*, *Rosaceae*, *Leguminosae*, *Rutaceae*, *Meliaceae*, *Euphorbiaceae*, *Vitaceae*, *Elaeocarpaceae*, *Tiliaceae*, *Thymelaeaceae*, *Ericaceae*, *Symplocaceae*, *Verbenaceae*, and *Rubiaceae*. Perhaps the one addition to the Bornean flora of greatest interest is the discovery of a representative of the genus *Faradaya* in British North Borneo, this characteristic genus having been known previously only from New Guinea, north-eastern Australia, and Polynesia. To the rather small list of species known only from Borneo and the Philippines are added *Artocarpus odoratissima* Blanco, *Knema glomerata* Merr., *Ellipanthus mindanaensis* Merr., *Grewia stylocarpa* Warb. (a variety in Borneo), and *Symplocos phanacrophlechia* Merr. Genera new to Borneo are *Scleropyrum*, *Elaeodendron*, *Columbia*, and *Faradaya*. The new generic name *Hoseanthus* is proposed for the form that Ridley described as *Hosca*, on account of the previous use of the name *Hosca* by Dennstaedt for a different group of plants.

GRAMINEAE.

Andropogon, Linnæus.

Andropogon serratus, Thunb. var. *nitidus* (Vahl) Hack. in DC. Monog. Phan. 6 (1889) 521.

BRITISH NORTH BORNEO, Usakan to Khota Balud, *Clemens* 9157, October 27, 1915.

Merrill, E. D. Notes on the Flora of Borneo. Philp. Jour. Sci. 11 (1916) Bot. 49-100.

Jour. Straits Branch R. A. Soc., No. 76, 1917.

Not previously reported from Borneo; India to China and Formosa and Malaya.

***Oplismenus*, Beauvois.**

***Oplismenus undulatifolius*, (Aubl.) Beauv. var. *imbecillis* (R. Br.) Hack. in Govt. Lab. Publ. (Philipp.) 35 (1905) 82.**

BRITISH NORTH BORNEO, Mount Kinabalu, Lobang, *Clemens* 10022, November 18, 1915.

This variety is widely distributed, extending from the Philippines and Malaya to Australia; new to Borneo.

***Panicum*, Linnaeus.**

***Panicum ridleyi*, Hack. in Trans. Linn. Soc. Bot. 2 (1893) 401, *nomen nudum*.**

Panicum latifolium, Hook. f. Fl. Brit. Ind. 7 (1897) 39, non Linn.

Panicum oryzoides, Roll. Mat. Fl. Mal. Penn. (Monocot.) 3 (1907) 138, non Sw.

BRITISH NORTH BORNEO, Mount Kalawat, *Clemens* 11159, along trails in thickets, December 10, 1915.

This species has been reported from Borneo by Ridley, as *Panicum latifolium*, Linn. The Linnean *Panicum latifolium* is typified by a species common in the eastern and southern United States, and has nothing to do with the Indo-Malayan form. It is neither *Panicum oryzoides*, Sw., nor *P. zizanioides*, HBK., the latter cited by Ridley as a synonym under *Panicum oryzoides*, Sw.

India to the Malay Peninsula and Borneo.

***Panicum cordatum*, Bosc in Moq. Pl. Jungh. (1854) 376.**

BRITISH NORTH BORNEO, Mount Kinabalu at Kian, *Clemens* 10029, 10028, November, 1915.

Malay Archipelago and the Philippines, not previously reported from Borneo.

***Isachne*, R. Brown.**

***Isachne clementis*, sp. nov.**

Culmis rigidis, usque ad 20 cm. altis, infra prostratis, radiantibus; *foliis* rigidis, lanceolatis, acuminatis, usque ad 3.5 cm. longis, basi plus minusve amplexicaubus, subtus sparsissime pilosis vel glabris, margine prominente denticulatis infra leviter ciliato-pilosis, vaginulis quam internodiis longioribus, leviter ciliato-pilosis; paniculis exsertis, 3 ad 1 cm. longis, panicloris, ramulis brevibus, patulis; *spiculis* circiter 3 mm. longis; *glumis* *racuis* subaequalibus, oblongis, obtusis,

3 mm. longis, quam fertilibus distincte longioribus, obscure 5-nerviis, apicem versus ciliato-setosis, marginibus inflexis; *glumis fertilibus* oblongo-ellipsoideis, rotundatis, 2 mm. longis, leviter appresse pilosis.

A rather rigid ascending, scarcely tufted plant, the culms glabrous, attaining a length of about 20 cm., below prostrate and rooting at the nodes. Leaves rigid, lanceolate, acuminate, 1.5 to 3.5 cm. long, 4 to 8 mm. wide, base rounded, somewhat clasping the stem, the lower surface with few, long, white, spreading hairs or glabrous, the margins rather prominently denticulate, the minute sharp teeth distinctly visible to the naked eye, below often ciliate-pilose with long white hairs; sheathes overlapping, ciliate-pilose with long, spreading, white hairs; ligule none. Panicles terminal, exserted, few-flowered, glabrous, 3 to 4 cm. long, the branches few, solitary, spreading, at most 1 cm. long, each bearing 2 or 3 spikelets, the pedicels of the lateral spikelets about 1.5 mm. long, of the terminal one longer. Empty glumes equal, oblong, obtuse, 3 mm. long, margins inflexed, somewhat spreading, obscurely 5-nerved, toward the apex sparingly ciliate-setose, distinctly exceeding the flowering glumes. Flowering glumes two, oblong-ellipsoid, rounded, 2 mm. long, sparingly appressed-pilose.

BRITISH NORTH BORNEO, Mount Kinabalu, Kemberanga, altitude about 2100 meters, *Clemens* 19503, November 15, 1915.

In many characters approaching *Isachne pangerangensis*, Z. & M., but not densely tufted, much taller, with larger leaves, and quite different spikelets. In its empty glumes distinctly exceeding the flowering glumes it approaches *Isachne kunthiana*, W. & A., but is not otherwise closely allied to that species.

***Isachne kinabaluensis*, sp. nov.**

Laxe caespitosa, erecta, rigida, usque ad 15 cm. alta, culmis simplicibus, nodis barbatis, vaginis margine ciliatis, cetero glabra vel subglabra; *foliis* lanceolatis, rigulis, subcoriaceis, acumatis, usque ad 8 cm. longis, margine cartilagineis, integris vel minutissime ciliato-denticulatis; *paniculis* longe exsertis, usque ad 9 cm. longis, panicilloribus, ramis patulis, inferioribus usque ad 5 cm. longis; *spiculis* 2 mm. longis, longe tenuiterque pedicellatis; *glumis vacuis* orbiculari-ellipticis, rotundatis, glabris vel apice obscurissime ciliatis, 7- vel 9-nerviis; *glumis fertilibus* ellipticis, 1.7 ad 2 mm. longis, basi et apice et margine parvisime ciliatis.

A laxly tufted, erect, simple, rigid, nearly glabrous grass attaining a height of about 15 cm., the culms smooth, glabrous, the nodes bearded. Leaves rigid, subcoriaceous, acuminate, base somewhat rounded, 3 to 8 cm. long, 5 to 9 mm. wide,

glabrous, or the margins very minutely ciliate-denticulate, often, however, entire, cartilaginous; sheaths generally overlapping, glabrous except the prominently ciliate margins; ligule none. Panicles lax, pyramidal, long-exserted, up to 9 cm. in length, few-flowered, the branches solitary, spreading, the lower ones up to 5 cm. in length, quite smooth and glabrous, the pedicels slender, 6 to 15 mm. in length. Spikelets 2 mm. long; empty glumes equal, orbicular-elliptic, rounded, 7- or 9-nerved, glabrous or the apex very obscurely and sparingly ciliate; flowering glumes elliptic, 1.5 to 2 mm. long, rounded, the base, apex, and margins sparingly ciliate, otherwise glabrous.

BRITISH NORTH BORNEO, Mount Kinabalu, Paka Cave to Lobang, between the altitudes of 1450 and 3000 meters, *Clemens 10021*, (type) November 15, 1916; near Kiau, altitude about 930 meters, *Clemens 10029*, mixed with *Panicum condatum* Buse.

Probably as closely allied to *Isachne horeckii*, Hack., as any other species, differing, however, in numerous characters.

Agrostis, Linnaeus.

Agrostis infirma, Buse in Miq. Pl. Jungh. (1854) 342.

BRITISH NORTH BORNEO, Mount Kinabalu, Low's Peak, *Clemens 10031*, altitude about 3600 meters, November 13, 1915.

This species has previously been reported only from Java; the Bornean specimen agrees closely with the original description, and agrees with Javan specimens kindly supplied by Mr. Backer of Brittenzorg. As noted by Mr. Backer *Agrostis infirma*, Buse, is not clearly distinguishable from the widely distributed *Agrostis alba*, Linn.

Agrostis canina, Linn., var. *borneensis* Standl., is represented by *Clemens 10030*, from the same locality as *A. infirma*, Buse, while a third species, much more delicate than either of the above, is represented by *Clemens 10032*, from the same general altitude, a single specimen.

CYPERACEAE.

Mapania, Aublet.

Mapania borneensis, sp. nov. § *Pandunophyllum*.

Rhizoma descendens, lignum; *foliis* usque ad 50 cm. longis et 2.5 cm. latis, 3-nerviis, apice abrupte caudato-acuminatis, integris vel margine in partibus superioribus minutissime denticulatis, infra longe gradatim angustatis, hand petiolatis, basi hand dilatatis; *pedunculis* 12 ad 20 cm. longis, monocephalis, basi bracteis distichis instructis; *capitulis*

ovoideis, circiter 2 cm. longis, spicis solitariis: *spiculis* numerosis confertis, circiter 8 mm. longis: *bracteis* 4 ad 6, oblongo-ovatis vel ovatis, obtusis vel retusis, circiter 1 cm. longis: *fructibus* oblongis, utrinque angustatis, 5 mm. longis, haud trigonis, rostratis: *stilis* 3-partitis.

A perennial plant, the rhizome erect, woody, stout, about 1 cm. in diameter. Leaves numerous, about 30 cm. long, 1.7 to 2.5 cm. wide, glabrous or the margins in the upper part minutely denticulate, 3-nerved, apex abruptly contracted into a caudate, denticulate appendage about 2 cm. in length, below very gradually narrowed, the lower part about 1 cm. wide, base not inflated. Scapes from below the leaves, slender, terete, 12 to 20 cm. long, the lower 4 to 6 cm. supplied with brownish, elongated, distichous bracts, the lower ones about 1 cm. long, the uppermost 4 to 5 cm. in length, usually from 4 to 6 bracts to each scape; heads solitary, terminal, ovoid, consisting of a single spike about 2 cm. in length, composed of numerous, densely crowded, 8 mm. long spikelets: bracts subtending the spike 4 to 6, subcoriaceous, oblong-ovate to ovate, obtuse or retuse, about 1 cm. long; glumes about 8 mm. long; nutlet oblong or oblong-ovoid, narrowed at both ends, terete, about 5 mm. long, smooth, prominently rostrate; style 3-partite.

BRITISH NORTH BORNEO, Mount Kinabalu, Gurulau Spur, on forested hillsides, *Clemens* 10785, November 27, 1915.

Well characterized by its leaves being abruptly contracted at the apex into a slender caudate appendage and very gradually narrowed toward the base, not contracted into a petiole, its inflorescence composed of a single spike, the scape supplied in the basal part with prominent elongated bracts. It may be as close to *Mapania longiflora*, C. B. Clarke, as any other species, but is not closely allied to this form.

Mapania montana, Ridl. in Journ. Str. Branch Roy. As. Soc. 44 (1905) 206.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau and Marai Parai Spur, *Clemens* 9945, 10872, 11092, 10870, November and December, 1915, on forested slopes.

This species was described from *Hariland 1801* collected at Panokok, Mount Kinabalu. The recently collected material differs from Ridley's species, as described, in its notably longer petioles, these in some cases attaining a length of 35 cm.

Pycreus, Beauvois.

Pycreus odoratus, (Linn.) Urb., var. **holosericeus**, (Link).

Cyperus holosericeus, Link, Hort. Berol. 1 (1827) 317.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, *Clemens* 10040, November 24, 1915.

This form has not previously been reported from Borneo. It is identical with Philippine material referred to Link's species by Kukenbal.

***Kyllinga*, Rottboell.**

***Kyllinga odorata*, Vahl, var. *cylindrica*, (Nees) Kuhnth.**

Kyllinga cylindrica, Nees in Wight, Contrib. (1834) 91.

BRITISH NORTH BORNEO, Jesselton, *Chempas* 9823, December 14, 1915.

Widely distributed in the tropics of the Old World; not previously reported from Borneo.

***Eleocharis*, R. Brown.**

***Eleocharis afflata*, Steud. Syn. Pl. Cuv. (1855) 76.**

BRITISH NORTH BORNEO, Kluang, *Topping* 1527, in wet places, altitude about 1060 meters. India to Luzon and Java.

COMMELINACEAE.

***Aneilema*, R. Brown.**

***Aneilema scaberrimum*, (Blume) Kuhnth, Enum. 4 (1843) 69.**

Commelina scaberrima, Blume, Enum. Pl. Jay. 1 (1827) 4.

Aneilema pubescens, Wall. Cat. (1831-32) No. 5218, *analema nudum*.

BRITISH NORTH BORNEO, Mount Kinabalu, Kluang, *Topping* 1530, November 3, 1915, on wet hillsides, altitude about 930 meters.

India to Sumatra and Java; not previously reported from Borneo.

MORACEAE.

***Artocarpus*, Forster.**

***Artocarpus odoratissima*, Blanco, Fl. Filip. (1837) 674.**

Artocarpus tarap, Becc. Nella Foresta de Borneo (1902) 626.

BRITISH NORTH BORNEO, Sandakan, *Villamil* 200, April 9, 1916, from cultivated trees, locally known as *tarap*.

I cannot distinguish this Bornean form from the Philippine *Artocarpus odoratissima*, Blanco, and have accordingly here reduced Beccari's *Artocarpus tarap* as a synonym. *Artocarpus odoratissima*, Blanco, is widely distributed in Mindanao in cultivation, there known as *marang*, and is also known from several localities in Mindoro, there known as *olay*.

***Ficus*, Linnaeus.**

Ficus callosa, Willd. Mem. Acad. Berl. (1789) 102.

BRITISH NORTH BORNEO, Sandakan, *Villamil* 179, March 12, 1916, in thickets at an altitude of about 85 meters.

Ceylon to Burma, the Malay Peninsula, and Java: new to Borneo.

SANTALACEAE.***Scleropyrum*, Arnott.**

Scleropyrum maingayi, Hook. f. Fl. Brit. Ind. 5 (1886) 235.

BRITISH NORTH BORNEO, Sandakan, *Villamil* 154, February 20, 1916 in forests near the Reservoir, altitude about 80 meters. Trunk spiny, the fruiting racemes borne on the branches, the fruits yellowish-green.

So far as I can determine from the published descriptions this specimen is referable to Hooker's species. The leaves are somewhat smaller than described by Gamble,* but in essentials the Bornean form appears to be the same as that from the Malay Peninsula and Penang. The genus is new to Borneo.

MYRISTICACEAE.***Knema*, Loureiro.**

Knema glomerata, (Blanco) Merr.

Sterculia glomerata, Blanco, Fl. Filip. (1837) 764.

Myristica heterophylla, F. Vill. Novis. App. Fl. Filip. (1880) 178.

Knema heterophylla, Warb. in Nov. Act. Akad. Naturf. 68 (1897) 573, t. 25, f. 1-2.

BRITISH NORTH BORNEO, Kalabakan water-hed, along the Pinayas River, *Villamil* 241, October 7, 1916, altitude 10 meters.

This specimen, although with very immature fruits, comes well within the range of variation of the very common *Knema glomerata*, (Blanco) Merr., which is found throughout the Philippines at low and medium altitudes: the species has not, however, previously been reported as an extra-Philippine one.

ROSACEAE.***Parinarium*, Aublet.**

Parinarium costatum, Blume ex Miq. Fl. Ind. Bat. 1 (1855) 354.

Jour. As. Soc. Beng. 75² (1912) 276.

R. A. Soc., No. 76, 1917.

BRITISH NORTH BORNEO, Sandakan, *Villamil* 204, January 8, 1916, along roadsides, altitude about 100 m.

Perak, Malacca, Penang, Singapore, Sumatra, and Java.

Parinarium glaberrimum, Hassk. in *Flora*, **27** (1844) 583.

BRITISH NORTH BORNEO, Siliampoun, *Villamil* 196, September 15, 1916, on forested slopes, altitude 500 meters.

I am unable to distinguish this form specifically from Hasskarl's species, which extends from Perak, through the Malay Archipelago and the Philippines to Polynesia, and which has numerous synonyms, including *Parinarium scabrum* Hassk., *P. laurinum*, A. Gray, *P. warburgii*, Perka., and *P. curranii*, Merr. It was first described by Rumphius as *atanus*,

Pygeum, Gaertner.

Pygeum pachyphyllum, sp. nov. § *Seriesparvum*.

Frutex vel arbor parva perspicue ferrugineo-pubescent; foliis coriaceis, ellipticis, integris, usque ad 16 cm. longis, breviter acuminatis, basi truncato-rotundatis vel leviter cordatis, nervis utrinque 10 ad 12, prominentibus, in pagina superiore cum reticulis laxis impressis; racemis axillari-bus, fasciculatis, dense ferrugineo-pubescentibus, circiter 1 cm. longis; sepalis 6, anguste oblongis; ovario dense ferrugineo-hirsuto; fructibus parce ferrugineo-villosis, seminibus parvis-sime ciliatis.

A shrub or a small tree, the branches, branchlets, inflorescences, and the leaves on the lower surface prominently and in part densely ferruginous-pubescent with short, spreading hairs, the branches and branchlets terete. Leaves coriaceous, elliptic, entire, 12 to 16 cm. long, 2.5 to 10 cm. wide, the upper surface dull-olivaceous, glabrous, or when young more or less ferruginous-pubescent especially along the midrib and lateral nerves, the lower surface very densely ferruginous-pubescent on the midrib and lateral nerves, with scattered hairs on the reticulations and surface generally, apex shortly acuminate, base truncate-rounded to shallowly cordate, the glands obscure, not projecting; lateral nerves 10 to 12 on each side of the midrib, spreading-curved, very prominent, the nerves and primary lax reticulations impressed on the upper surface; petioles densely ferruginous-pubescent, 5 to 8 mm. long. Racemes axillary, fascicled, short, few-flowered, densely ferruginous-pubescent, about 1 cm. long; pedicels 2 mm. long. Calyx-tube slightly enlarged upward, about 2 mm. long, sparingly pubescent, the lobes 6, narrowly oblong, pubescent, about 1.2 mm. long. Stamens about 25; filaments 2.5 to 4 mm. long. Ovary narrowly ovoid, densely ferruginous-pubescent, including the style about 6 mm. long, the style pubescent

below, glabrous above. Fruits dark-brown when dry, slightly compressed, about 6 mm. long, 8 mm. wide, usually 2-seeded, sparingly ferruginous-villous or ciliate, the seeds with few, long, shining, pale hairs.

BRITISH NORTH BORNEO, Mount Bungal, *Clemens* 11200, December 9, 1915, along trails in forests, the flowers dull yellowish-brown.

A species of the section *Sericospermum*, well characterized by its elliptic, prominently nerved and reticulate, coriaceous leaves, its rather dense ferruginous indumentum, and its short fascicled racemes.

***Pygeum ellipticum*, sp. nov. § *Sericospermum*.**

Frutex vel arbor, partibus junioribus et inflorescentiis et foliis subtus in costa nervisque plus minusve castaneo-pubescentibus: *foliis* ellipticis, crasse coriaceis, usque ad 13 cm. longis, integris, in pagina superiore minute puncticulatis, obtusis vel obtuse acumminatis, basi late acutis vel leviter decurrento-acumminatis, glandulis ellipticis, prominentibus, nervis utrinque circiter 10, prominentibus: *racemis* axillaribus, fasciculatis, circiter 3 cm. longis: *calycis* lobis 10: *ovario* dense pubescente.

A shrub or tree, the young branchlets, inflorescence, and the lower surface of the leaves on the midrib and to a less degree on the nerves rather prominently pubescent with dark-brown or castaneous hairs, the branches glabrous, terete, lenticellate, dark-brown. Leaves thickly coriaceous, elliptic, 11 to 13 cm. long, 7 to 9 cm. wide, entire, apex obtuse or obtusely acuminate, base broadly acute or somewhat decurrent-acuminate, the glands prominent, elliptic, slightly raised on the upper surface, the upper surface olivaceous, shining, the midrib usually pubescent, the lower surface brownish; lateral nerves about 10 on each side of the midrib, very prominent, spreading, slightly curved, the reticulations lax; petioles stout, pubescent, 1 to 1.8 cm. long. Racemes axillary, fascicled, about 3 cm. long, the pedicels about 1 mm. long, the bracteoles elliptic-ovate, obtuse, nearly 2 mm. long, pubescent. Calyx-tube about 2 mm. long, obconic, 2 mm. in diameter at the base, nearly twice as wide at the throat, pubescent, the lobes 10, narrowly oblong, densely villous, about 1.5 mm. long. Stamens about 25, 2 to 5 mm. long. Ovary ovoid, densely villous; style 4 mm. long, glabrous or with few scattered hairs.

SARAWAK, Mount Poe collected by *Lee Koo*, July, 1908, received from the Sarawak Museum.

In some respects similar to *Pygeum pachyphyllum*, Merr., but with much longer racemes, more numerous calyx-lobes, quite different indumentum, the base of the leaves very different in shape and prominently glandular, and the upper surface with numerous, scattered, minute pits.

CONNARACEAE.

Ellipanthus, Hooker f.

Ellipanthus mindanaensis, Merr. in Philip. Journ. Sci. **4** (1909) Bot. 124.

BRITISH NORTH BORNEO, Kalamakam, *Villamil* 256, September 21, 1916, in forests along streams near sea level.

While this specimen is not directly comparable with *Ellipanthus mindanaensis*, Merr., the type of the latter being a fruiting specimen and the Bornean plant being in flower manifestly but a single species is represented by the two. The Bornean plant has somewhat thinner leaves than the Mindanao one, and the ultimate reticulations are not as conspicuous. The species is well characterized by its distinctly peltate leaves, the petioles being inserted from 1 to 2 mm. above the basal margin.

LEGUMINOSAE.

Parkia, R. Brown.

Parkia singularis, Miq., Fl. Ind. Bat. **1** (1858) 1078; Suppl. (1862) 285.

BRITISH NORTH BORNEO, Sandakan, *Villamil* 201, January 8, 1916; altitude about 100 meters.

The specimens agree closely with Miquel's extended description as given in his supplementary volume on Sumatra. The pinnæ are 2-jugate, and the leaflets, somewhat smaller than described by Miquel, are pale beneath. The species has previously been reported only from Sumatra, and is distinguished among all the species of *Parkia* by its large leaflets.

Mezoneurum, Desfontaines.

Mezoneurum sumatranum, (Roxb.) W. & A., Prodr. (1834) 283.

Cassalpinia sumatranum, Roxb. Hort. Beng. (1814) 32, *nomina nudum*; Fl. Ind. ed. 2, 2 (1832) 366.

BRITISH NORTH BORNEO, Sandakan, *Villamil* 190, March 20, 1913, borders of swamps near the Wireless Station.

New to Borneo: Malay Peninsula, Sumatra, and southern Palawan.

Pahudia, Miquel.

Pahudia borneensis, (Harms), comb. nov.

Azcha borneensis, Harms in Fedde, Reperl. **14** (1916) 256 (April 15).

Pahudia acuminata, Merr. in Philip. Journ. Sci. **11** (1916) Bot. 86 (June 24).

The type of both *Azelia borneensis*, Harms, and *Palaudia acuminata*, Merr., is *Hose 93*, and Harms's specific name has priority. The number of Fedde's Repertorium containing the description of *Azelia borneensis*, Harms, did not reach Manila until November 29, 1916. Dr. Harms does not consider that the Malayan *Palaudia*, Miquel, is generically distinct from the African *Azelia*, Smith, in which he may be correct, but in this connection *Azelia*, Smith (1798), is entirely different from *Azelia*, Gmel. (1791), and I prefer to retain Miquel's generic name *Palaudia*.

***Desmodium*, Desvaux.**

***Desmodium laxum*, DC.** in Ann. Sci. Nat. **4** (1825) 336.

BRITISH NORTH BORNEO, Mount Kunabalu, Marai Parai Spur, *Clemens 10901*, November 24, 1915.

India to southern China, the Philippines, and Malaya.

***Uraria*, Desfontaines.**

***Uraria picta*, (Jacq.) Desv., Journ. Bot. **1** (1913) 123, t. 5, f. 19.**

Hedysarum pictum, Jacq. Coll. **2** (1788) 262.

BRITISH NORTH BORNEO, Kibata Balud to Kibayo, *Clemens 9285*, *Topping 1484*, October 28, 1916.

Widely distributed in the tropics of the Old World, introduced into the New World, but not previously recorded from Borneo.

***Mucuna*, Adanson.**

***Mucuna toppingii*, sp. nov. § *Zoophthalmonne*, *Carpopogon*.**

Frutex alte scandens, foliis subtus parce hirsutis, inflorescentibus dense ferrugineo-pubescentibus et pilis rigidis fuscis instructis; *foliis* ovatis vel elliptico-ovatis, acuminatis, usque ad 15 cm. longis, basi rotundatis, nervis utrinque circiter 6; *inflorescentiis* racemosis; *racemis* axillaribus, solitariis vel fasciculatis, usque ad 20 cm. longis; *floribus* atro-purpureis, circiter 1 cm. longis, *calyce* obliquo, pilis rigidis instructo; *carina* cartilagineo-acuminata; *leguminibus* junioribus oblongis, dense ferrugineo-pubescentibus et pilis rigidis fuscis numerosissimis instructis, suturis alatis, valvis planis, laud transverse lamellatis.

A more or less woody, luxuriant vine, the branches terete, brownish, striate, glabrous, sparingly lenticellate. Petioles 8 to 12 cm. long, glabrous, or when young sparingly hirsute; stipels acicular, about 3 mm. long; leaflets ovate to elliptico-ovate, the terminal one equilateral, the others more or less inequilateral, olivaceous, shining, chartaceous, 12 to 15 cm. long, 7.5 to 9.5 cm. wide, base rounded or very shallowly

cordate, apex rather prominently acuminate, the lower surface sparingly hirsute on the midrib and lateral nerves, the upper glabrous; lateral nerves about 6 on each side of the midrib, prominent, curved-ascending; petioles 5 to 7 mm. long. Racemes axillary, solitary or fascicled, slender, up to 20 cm. in length, sometimes with one or two branches forming a depauperate panicle, 1 to 4 in each axil, rather densely ferruginous-pubescent and with long, stiff, scattered hairs intermixed, the nodes prominently thickened. Flowers dark-purple, about 4 cm. long, their pedicels densely ferruginous-pubescent, up to 1.5 cm. long, each with a pair of orbicular-ovate, rounded, 4 to 5 mm. long, deciduous bracteoles at the apex. Calyx in bud somewhat cup-shaped, in anthesis broad, oblique, up to 1.4 cm. wide, the upper lobe distinct in bud, nearly obsolete in anthesis, the two lateral ones inequilateral, ovate, rounded, about 2 mm. long, the lower one oblong to triangular-ovate, obtuse, about 5 mm. long, outside densely ferruginous-pubescent and supplied with numerous long, stiff, brown, stinging hairs. Standard glabrous, orbicular, 2.5 cm. in diameter, rounded, base shallowly cordate, the claw stout, short, about 2 mm. long, twice as wide. Wings oblong, 4 cm. long, 1.4 cm. wide, rounded, the claw 1 to 5 mm. long, the basal auricle ovate, rounded, 3 mm. long, the back and margins in the lower 10 to 12 mm. pubescent, otherwise glabrous. Keel about as long as the wings, about 6 mm. wide, glabrous, somewhat curved-falcate above, the tip cartilaginous, acuminate, the claw about 6 mm. long, the auricle ovate, rounded, about 2 mm. long. Ovary oblong, densely covered with stiff, ferruginous, stinging, appressed hairs; style hirsute. Young pods oblong, flattened, about 7 cm. long and 3 cm. wide, densely ferruginous-pubescent, and supplied with very numerous stiff, ferruginous, stinging hairs 2 to 3 mm. in length, the sutures narrowly winged throughout their length, the valves flat, plain, with no transverse platts.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, *Clements 10085* (type), *10049*, November, 1915, *Topping 1561*, November 2, 1915, in thickets, altitude about 1450 meters.

A very characteristic species manifestly belonging in the group with *Mucuna acuminata*, Grah., but with an entirely different inflorescence. In its vegetative characters it approaches *Mucuna biplicata*, T. & B., but belongs to quite another section of the genus, the valves having no transverse platts.

RUTACEAE.

Tetractomia, Hooker f.

***Tetractomia obovata*, sp. nov.**

Frutex usque ad 2 m. altus, glaber, vel inflorescentiis parcissime pubescens; *foliis* coriaceis, obovatis, usque ad

9 cm. longis, olivaceis, nitidis, apice rotundatis vel retusis, basi cuneatis, nervis utrinque circiter 10, distinctis; *inflorescentiis* axillaribus, pedunculatis, usque ad 5 cm. longis, paucifloris; *floribus* circiter 1 cm. diametro; *petalis* ovatis, acutis, 4 mm. longis; *fructibus* 4 mm. longis.

A shrub 2 m. high or less, quite glabrous or the florescence, sparingly pubescent on its younger parts. Branches and branchlets terete, stout, the former brownish-gray, the latter nearly black when dry, the petiolar scars rather prominent. Leaves coriaceous, dark-olivaceous when dry, somewhat shining, 5.5 to 9 cm. long, 4 to 6 cm. wide, apex broadly rounded, sometimes retuse, base narrowed, cuneate, the lower surface paler than the upper, with very numerous, small, brownish glands; lateral nerves about 10 on each side of the midrib, slender but rather prominent, obscurely anastomosing; petioles rather stout, 1 to 1.4 cm. long. Cymes axillary, up to 5 cm. long, peduncled, few-flowered, the pedicels 4 mm. long, the bracteoles broadly ovate, thick, about 1 mm. long. Flowers 4-merous, about 1 cm. in diameter. Calyx nearly square in outline, 3 mm. wide, the lobes short, rounded to acute, thick, concave. Petals ovate, punctate, 4 mm. long, 3 mm. wide, acute, persistent. Fertile stamens 4, opposite the sepals, their filaments 4 mm. long, with four alternating, sterile, 2 mm. long filaments opposite and attached to the base of the petals. Disk prominent. Ovary depressed, sunk in the disk, the top broadly pyramidal and obscurely 4-lobed; style 3 mm. long. Fruit composed of four, erect, free or nearly free, oblong, thickly coriaceous, 6 mm. long cocci.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Clemens 11025*, December 1, 1915, growing in open places, the flowers green or greenish.

A characteristic representative of this small genus, readily distinguished by its rather large flowers. It is apparently most closely allied to *Tetractomia tetrandra* (Roxb.) (*Melicope tetrandra*, Roxb., *Tetractomia roxburghii*, Hook. f.) of the Malay Peninsula.

MELIACEAE.

Aglaia, Loureiro.

Aglaia borneensis, sp. nov. § *Hearnia*.

Arbor parva, circiter 4 m. alta, ramulis et petiolis et inflorescentibus densissime minuteque stellato-tomentosis, indumento brunneo; *foliis* circiter 1 m. longis, foliolis circiter 31, alternis, longe petiolulatis, oblongis, basi inaequilateralibus, rotundatis vel superioribus acutis, apice perspicue acuminatis, usque ad 22 cm. longis et 7 cm. latis, nervis utrinque circiter 20, supra impressis, subtus prominentibus, subtus plus

minuſve minuſque ſtollato-lepidotis; *inſloriſcentiis* axillariſ-
bus, pyramidato-paniculatis, uſque ad 45 cm. longis, breviter
pedunculatis, ramis inferioribus circiter 16 cm. longis, multi-
floris; *floribus* 5-meris, breviter pedicellatis; *calyce* extus
minute ſtollato-tomentoso; *petalis* liberis, glabris, 1 mm.
longis, tubo turbinato, glabro.

A ſmall tree about 4 m. high the trunk about 10 cm. in
diameter, the branches, petioles, rachises and inflorescences
densely and minutely ſtollato-lepidote, the indumentum brown.
Ultimate branches terete, about 1 cm. in diameter. Leaves
alternate, ſcattered, about 1 m. long; leaflets about 31, alter-
nate, chartaceous, oblong, 13 to 22 cm. long, 4 to 7 cm. wide,
baſe ſomewhat inequilateral, broadly rounded, or the uppermoſt
ones acute at the baſe, apex prominently acuminate, the acu-
men uſually acute, ſometimes blunt, pale or olivaceous when
dry, the upper ſurface glabrous, ſhining, the lower densely
and minutely fuscous ſtollato-puberulent on the midrib, and
to a leſs degree on the lateral nerves, with widely ſcattered
ſtollate ſcales on the ſurface; lateral nerves about 20 on each
ſide of the midrib, impreſſed on the upper ſurface, very pro-
minent on the lower ſurface, ſomewhat ſpreading, curved,
anastoſing; petiolules densely brown-lepidote-puberulent, 1
to 1.5 cm. long. Panicles axillary, ſolitary, pyramidal, up to
45 cm. long, the lower branches up to 16 cm. in length.
Flowers very numerous, 5-merous, yellowiſh-green, rather
looſely diſpoſed on the ultimate branchlets, their pedicels about
0.5 mm. long, densely ſtollato-puberulent. Calyx-lobes 5,
broadly triangular, 0.3 mm. long or leſs, obtuſe. Petals 5,
obovate to obovate-elliptic, glabrous, 1 mm. long. Staminal-
tube turbinate, free, glabrous, 0.5 mm. long, margin crenate,
anthers uſually 5, ſometimes 4, inſerted at the margin of the
tube between the crenulations.

BRITISH NORTH BORNEO, Suluapoon, *Villamil* 227, Sep-
tember 1, 1916, in flat moiſt regions, altitude about 50 meters.

Among thoſe ſpecies of *Hearnia* previously deſcribed this
comes cloſeſt to *Hearnia beccariana*, C. DC. = *Aglaia beccariana*,
Harms, from which it is at once diſtinguiſhed by its
much longer leaves, its much larger leaflets and its uniformly
dense, brown, ſtollato-puberulent indumentum on the branches,
petioles, rachises, petiolules, midribs on the lower ſurface of
the leaves, and inflorescences.

***Aglaia tripetala*, sp. nov. § *Euaglaia*.**

Arbor circiter 30 m. alta, ramulis junioribus inflorescenti-
ſque plus minuſve lepidotis, denſe ramis glabrescentibus;
foliis 30 ad 40 cm. longis, alternis, foliolis 7 vel 9, oppoſitis,
oblongis, obtuſis, leviter falcatis, baſi valde inequilateralibus,
uſque ad 13 cm. longis, nervis utrinque circiter 12, tenuibus;
inſlorescentiis axillaribus, folia ſubaequantibus, ramis primariis

paucis, patulis, inferioribus usque ad 12 cm. longis: *floribus* 3-meris, pedicellatis in ramulis ultimis subracemose dispositis; *calyci* lepidoto, leviter 3-lobato; *petalis* 3, ellipticis, concavis, 3 mm. longis, liberis; *staminibus* 6, inclusis.

A tree about 30 m. high according to the collector, quite glabrous except the young branchlets and the inflorescence. Branches terete, dark-brown, the ultimate ones about 5 mm. in diameter, glabrous, the tips of the ultimate branchlets densely lepidote. Leaves alternate, 30 to 40 cm. long, entirely glabrous: leaflets 7 or 9, opposite, pale-olivaceous when dry, somewhat falcate, rather tough in texture, base strongly inequilateral, one side broadly rounded and extending about 5 mm. along the midrib below the narrower acute side; lateral nerves slender, about 12 on each side of the midrib; petiolules 5 to 7 mm. long. Panicles axillary, about as long as the leaves, the older parts glabrous, the younger parts with scattered, pale, lepidote scales, the primary branches few, scattered, the lower ones up to 12 cm. in length. Flowers 3-merous, greenish-yellow, comparatively large, cymosely and rather laxly disposed on the ultimate branchlets, their pedicels 1 to 2 mm. long. Calyx rather densely lepidote, about 2 mm. in diameter, with three, broad, rounded, shallow lobes. Petals 3, entirely free, glabrous, elliptic, concave, rounded, 3 mm. long. Staminal-tube somewhat obovoid or obconic, about 2.8 mm. long, glabrous, with three broad very shallow lobes. Stamens 6, included, about 1.2 mm. long. Rudimentary ovary glabrous, about 1 mm. long, often 3-lobed.

BRITISH NORTH BORNEO, Sandakan, *Villamil* 184, March 16, 1913, back of a swamp beyond the Wireless Station.

A species well characterized by its comparatively large, 3-merous flowers, its glabrous leaves, elongated, sparingly lepidote inflorescences, and its very strongly inequilateral leaflets. It is perhaps most closely allied to *Aplasia laxiflora*, Miq.

EUPHORBIACEAE.

Antidesma, Linnaeus.

Antidesma cauliflorum, sp. nov.

Arbor circiter 5 m. alta, ramulis junioribus et petiolis et foliis subtus in costa nervisque et inflorescentiis prominente subferrugineo-pubescentibus, *foliis* oblongis, usque ad 17 cm. longis, chartaceis, nitidis, acute acuminatis, basi obtusis vel rotundatis, nervis utrinque 7 ad 10, curvato-adscendentibus, prominentibus; stipulis lineari-lanceolatis, acuminatis, circiter 1 cm. longis, leviter falcatis, deciduis; *inflorescentiis* ex truncis et ramis vetustioribus, usque ad 15 cm. longis, depauperato paniculatis; *racemis* paucis, elongatis; *pedicellis* 1.5 ad 2 mm. longis, quam bracteolis duplo longioribus; *floribus* 3-

mentis; *fructibus* rubris, ovoides vel ellipsoideis, turgidis, inaequilateralibus, leviter carinatis, grosse rugoso-reticulatis, circiter 7 mm. longis, stigmate terminali.

A tree about 5 m. high, the branchlets, petioles, lower surface of the leaves on the costa and nerves and the inflorescences prominently pubescent with suberruginous hairs. Older branches grayish, brittle, glabrous. Leaves chartaceous, smokyaceous, shining, oblong, 12 to 14 cm. long, 3.5 to 5.5 cm. wide, base obtuse to somewhat rounded, apex prominently acuminate, the acumen acute or sometimes apiculate, the upper surface slightly punctulate, glabrous, or the midrib slightly pubescent; lateral nerves 7 to 10 on each side of the midrib, curved-ascending, rather obscurely anastomosing, prominent; petioles densely pubescent, 5 to 8 mm. long; stipules linear-lanceolate, somewhat falcate, acuminate, pubescent, about 1 cm. long, deciduous. Inflorescences from the older branches and from tubercles on the trunk, up to 15 cm. long, ferruginous-pubescent, each with usually two elongated branches; sessile flowers pedicelled, 5-merous, the calyx divided about one-half to the base, the lobes oblong-ovate, acute, pubescent, about 0.6 mm. long; pedicels pubescent, in fruit 1.5 to 2 mm. long, about twice as long as the inconspicuous, pubescent bractlets. Fruits glabrous, red, ovoid to ellipsoid, inequilateral, turgid, slightly carinate, very coarsely and conspicuously rugose-reticulate, acute, about 7 mm. long, the stigma apical.

BRITISH NORTH BORNEO, Mount Kinabalu, Guruhau Spur and Kiau, *Clemens 10790* (type), 9944, November, 1915.

A species readily distinguished by its cauline inflorescence. In vegetative characters it approaches *Antidesma montanum* Blume, and *A. moritzii*, Muell.-Arg., and its alliance is probably with these species, which, however, have terminal inflorescences.

***Antidesma clementis*, sp. nov.**

Frutex vel arbor parva, ramulis et petiolis et intructescensibus plus minusve pubescentibus; *foliis* oblongo-lanceolatis, subcoriaceis, olivaceis, nitidis, usque ad 9 cm. longis, tenuiter acuminatis, basi acutis, nitidis, nervis utrinque circiter 7, prominentibus; stipulis acicularibus, pubescentibus, circiter 8 mm. longis; spicis axillaribus, solitariis, circiter 4 cm. longis; *floribus* ♀ 5-meris, sessilibus; *fructibus* oblongo-ovatis, compressis, 4 cm. longis, inaequilateralibus, basi rotundatis, apice acutis, extus leviter strigilloso-hirsutis, laxe reticulatis, stigmate terminali.

A shrub or small tree, the branchlets, petioles and spikes more or less pubescent, the branchlets densely so, the indumentum dirty brown. Leaves oblong-lanceolate, subcoriaceous, olivaceous and shining when dry, 6 to 9 cm. long, 2.5 to 3 cm. wide, apex slenderly acuminate, the acumen blunt or acute,

often apiculate, base acute, the upper surface entirely glabrous, the lower sparingly pubescent on the midrib and lateral nerves; lateral nerves about 7 on each side of the midrib, prominent, anastomosing; petioles about 2 mm. long; stipules acicular, about 8 mm. long, acuminate, pubescent. Spikes solitary, simple, from the lower axils, up to 4 cm. long. Pistillate flowers sessile, 5-merous, the disk-like central part of the calyx thick, about 1.2 mm. in diameter, the lobes membranaceous, pubescent, 0.5 mm. long; bracteoles not seen. Fruits red, oblong-ovate, compressed, 1 cm. long, 5 mm. wide, base rounded, apex acute, sparingly strigillose-hirsute externally, laxly reticulate, dark-brown when dry, shining; the stigma terminal.

BRITISH NORTH BORNEO, Mount Kipabalu, Lobang, *Clemens 19574*, November 11, 1915.

A species well characterized by its lanceolate or oblong-lanceolate, prominently acuminate, rather few-nerved leaves, its narrow stipules, and its large, compressed, sessile fruits. In vegetative characters it resembles *Antidesma stenophyllum*, Merr., differing in its much smaller, fewer-nerved leaves. From *Antidesma gibbsiae*, Hutchinson, the type of which was from Tenom, and which has sessile 1 cm. long fruits and subulate stipules, it differs in the same characters as from *A. stenophyllum*, Merr.

***Antidesma inflatum*, sp. nov.**

Arbor circiter 5 m. alta, praeter inflorescentias dense rubiginoso-pubescentes glabra: *foliis* subcoriaceis, nitidis, subobovaceis, oblongo-ellipticis, usque ad 18 cm. longis, basi acutis, apice abrupte obtuseque acuminatis, nervis utrinque 8 vel 9, subtus prominentibus; *stipulis* coriaceis, ovaris vel oblongo-ovatis, obtusis vel acuminatis, 5- ad 7-nerviis, 10 ad 12 mm. longis, persistentibus; *inflorescentiis* ♀ terminalibus simplicibus, racemosis, usque ad 12 cm. longis, basi bracteis prominentibus instructis; *floribus* 5-meris, calycis lobis brevibus, pubescentibus; *fructibus* valde inflatis, circiter 9 mm. longis, inaequilateralibus, reticulatis, glabris, apice rotundatis, stigmatibus distincte laterali.

A tree about 5 m. high, entirely glabrous except the densely rubiginous-pubescent inflorescence. Branches slender, terete, smooth, brownish-olivaceous. Leaves subcoriaceous, oblong-elliptic, subobovaceous, of nearly the same color on both surfaces, shining, 12 to 18 cm. long, 5 to 8 cm. wide, base acute, apex abruptly and obtusely acuminate; lateral nerves 8 or 9 on each side of the midrib, prominent on the lower surface, anastomosing, the primary reticulations lax; petioles 5 to 8 mm. long; stipules persistent, coriaceous, inequilateral, ovate to oblong-ovate, obtuse to acuminate, 10 to 12 mm. long, 6 to 8 mm. wide, 5- to 7-nerved. Fruiting racemes terminal,

solitary, simple, up to 12 cm. long, the basal part of the peduncle with several pairs of conspicuous, oblong-lanceolate, acuminate, pubescent, 5 to 7 mm. long bracts; pedicels pubescent, 4 to 5 mm. long; bracteoles inconspicuous. Calyx about 2 mm. in diameter, pubescent, the lobes triangular, acute, about 0.5 mm. long. Disk very prominent, glabrous, thick, as wide as the calyx in fruit. Fruits 9 mm. long, strongly inflated, ovoid, inequilateral, rounded at both ends, red, glabrous, slightly keeled, prominently reticulate, the stigma distinctly lateral, situated at about 2 mm. below the rounded apex of the fruit.

BRITISH NORTH BORNEO, Kalabakan watershed, *Villamil* 255, October 6, 1916, along the margins of swamps at sealevel.

A rather strongly marked species, in vegetative characters somewhat resembling *Antidesma stipulare*, Blume, but radically different in its fruit characters. It is readily distinguishable by its rubiginous-pubescent racemes, the plant otherwise entirely glabrous, and its strongly inflated fruits which are rounded at both ends, the stigmas distinctly lateral, not terminal.

Sauropus, Blume.

***Sauropus androgyna*, (Linn.) Merr. in Forestry Bur. (Philip.) Bull. 1 (1903) 30.**

Cayota androgyna, Linn. Mant. 1 (1767) 128.

Sauropus albicans, Blume, Bijdr. (1825) 596.

BRITISH NORTH BORNEO, Jesselton, *Topping* 1934, December 4, 1916.

India to China southward to Java and the Moluccas.

Ostodes, Blume.

***Ostodes villamilii*, sp. nov. § *Desmostemon*.**

Arbor, partibus junioribus exceptis glabra; foliis subcoriaceis, integris, oblongis vel elliptico-oblongis, usque ad 16 cm. longis, basi acutis, vix glandulosis, apice acutis vel obtusis, nervis utrinque 8 ad 10, subtus prominentibus; inflorescentis axillaribus, paniculatis, usque ad 12 cm. longis; floribus ♂ numerosis, calyci irregulariter 3-fisso, lobis integris vel 2-lobatis; petalis oblongo-ellipticis, integris, obtusis, circiter 4.5 mm. longis, intus villosis; staminibus circiter 7, filamentis brevibus, pilosis.

A tree, according to the collector about 30 m. high, dioecious, the inner bark yellowish, with the odor of *Jatropha curcas*, the twigs yielding a reddish sap. Branches terete, grayish, glabrous, the branchlets appressed-pubescent with

short pale hairs. Leaves subcoriaceous, entire, oblong to oblong-elliptic, 9 to 16 cm. long, 4 to 6 cm. wide, subequally narrowed to the acute, scarcely glandular base and to the acute or blunt apex; lateral nerves 8 to 10 on each side of the midrib, prominent on both surfaces, curved, anastomosing, the reticulations prominent; petioles 1.5 to 4 cm. long. Staminate inflorescences axillary, solitary, paniculate, up to 12 cm. in length, glabrous or nearly so, branched from near the base, the branches few, distant, spreading, the lower ones up to 4 cm. in length, the flowers white, cymosely disposed on the branchlets, their pedicels up to 5 mm. long. Calyx about 4 mm. long, rather irregularly splitting into three oblong-ovate lobes which extend nearly to the base, two of the lobes cleft at the apex, somewhat contracted above and bearing two thin, suborbicular lobules about 1 mm. in diameter, the third lobe with a single terminal lobule. Petals 5, free, oblong-elliptic, obtuse, entire, about 4.5 mm. long, rather densely villous with pale hairs on the inner surface below. Disk glands prominent, glabrous, up to 1 mm. in length. Stamens usually 5, their filaments slightly united, pale-villous, up to two mm. in length. Rudimentary ovary none. Pistillate flowers and fruits unknown.

BRITISH NORTH BORNEO, Sandakan, *Villamil 164*, February 27, 1916, in forests, altitude about 90 meters.

A characteristic species apparently not closely allied to any previously described form. It is somewhat anomalous in the genus *Ostodes* in its few stamens, in this character approaching *Ostodes minor*, Mnell.-Arg. The orbicular terminal appendages of the calyx lobes are characteristic, these corresponding to the petals in number, arranged on the irregular lobes, two lobes bearing two each, the third a single one.

CELASTRACEAE.

Elaeodendron, Jacquin.

Elaeodendron subrotundum, King in Journ. As. Soc. Beng. 65² (1896) 356.

SARAWAK, Lundu, *Forworthy 119*, May 18, 1908, in swamps at the mouth of the river; known to the Dyaks as *galan*. BRITISH NORTH BORNEO, Segalind River, *Forworthy 623*, in mangrove swamps, locally known as *landing-landing*.

Malay Peninsula and the Andaman Islands.

The Bornean material perfectly matches *Ridley 12481* from Johore. The minute appressed teeth on the leaf-margins are not mentioned by King in the original description of the species.

VITACEAE.

Ampelocissus, Planchon.***Ampelocissus pedicellata*, sp. nov. § *Kalocissus*.**

Frutex scandens partibus junioribus et inflorescentibus et petiolis et petiolulis et foliorum lamina costâ nervisque ferrugineo-arachnoideo-villosis: *foliis* palmato-pedato-5-foliolatis, foliolis oblongis, coriaceis, usque ad 20 cm. longis, tenuiter acuminatis, basi plus minusve inaequilateralibus, acutis, vel acuminatis, margine distanter spinuloso-denticulatis vel integris, nervis utrinque circiter 9; *inflorescentibus* ut videtur longe pedunculatis, *racemis* numerosis, confertis, 2.4 ad 3.5 cm. longis, racemose dispositis; *floribus* glabris, 4-meris, omnibus breviter pedicellatis; *petalis* 2 ad 2.5 mm. longis, oblongis.

A scandent shrub, the younger parts, inflorescences, petioles, petiolules, and the midrib and nerves on both surfaces of the leaves densely villous with cobweb-like ferruginous hairs, these in age often pale in color. Leaves apparently long-petioled, the leaflets 5, the three middle ones with petiolules 2.5 to 3.5 cm. in length, the two lateral ones on each side on a common branch about as long as the central petiolules, their petiolules 5 to 10 mm. long, the leaflets coriaceous, dark-brown or nearly black when dry, oblong, 15 to 20 cm. long, 5.5 to 8 cm. wide, base acute or acuminate, usually more or less inequilateral, apex slenderly and sharply acuminate, margins distantly spinulose-dentate by the excurrent lateral nerves, or subentire; lateral nerves about 9 on each side of the midrib, very prominent on the lower surface as are the primary reticulations. Inflorescences apparently long-peduncled, the upper 15 cm. bearing numerous, spreading-ascending, 2.5 to 3.5 cm. long racemes, the common rachis and those of the racemes densely ferruginous-lanate. Flowers numerous, entirely glabrous, their pedicels 1.5 to 2 mm. long. Calyx about 1 mm. in diameter, the lobes four, rounded, obscure. Petals 4, oblong, obtuse or acute, 2 to 2.5 mm. long. Ovary glabrous, somewhat ellipsoid, the style about 0.6 mm. long.

SARAWAK, without definite locality, *Native collector* 247 (Bur. Sci.).

A most characteristic species at once distinguished from all described forms by its pedicelled flowers. It is suspected that it is the same as the form indicated by Planchon in DC. Monog. Phan. 5 (1887) 411 as "*A. sp. nova*, Borneo (Becari, no. 178, in herb. Kew)," but not described by him.

***Ampelocissus tenuis*, sp. nov. § *Kalocissus*.**

Scandens, tenuis, ramulis circiter 1 mm. crassis, partibus junioribus et petiolis et inflorescentibus et foliolis subtus in costâ nervisque dense rufè-lanatis; *foliis* pedato-palmato-5-foliolatis,

petiolulus interioribus 1-foliolatis, lateralibus 2-foliolatis, foliis membranaceis, oblongo-ellipticis vel oblongis, usque ad 6 cm. longis, apice acuminatis apiculatisque, basi acutis, margine leviter undulatis, distanter spinuloso-denticulatis, nervis utrinque 5 vel 6; *inflorescentiis* longe tenuiterque pedunculatis, spicis circiter 15, circiter 1 cm. longis, patulis; *floribus* parvis, 4-meris, petalis junioribus circiter 1 mm. longis.

A very slender, scandent plant, the branches, branchlets, inflorescences, petioles petiolules and the midrib and nerves on the lower surface of the leaves densely rusty or rubiginous-lanate, the branches very slender, about 1 mm. in diameter. Leaves palmate-pedate 5-foliolate, their petioles slender, 2 to 3 cm. long, the stirules ovate to oblong-ovate, slightly pubescent, about 3 mm. long. Leaflets membranaceous, oblong-elliptic to oblong, brownish when dry, the upper surface quite glabrous, 2 to 6 cm. long, 1 to 2.5 cm. wide, the central ones larger than the lateral, the interior on a 3 to 4 mm. long, petiolule, the two lateral ones on each side subsessile on 4 to 6 mm. long, branchlets of the common petiole, the central leaflet equilateral, the others inequilateral, apex acuminate and apiculate, base usually acute, margins distantly spinulose-denticulate by the excurrent lateral nerves, slightly undulate; lateral nerves 5 or 6, slender, densely brown-tomentose on the lower surface. Inflorescences on a very slender peduncle which attains a length of at least 10 cm., 1 mm. in diameter or less, composed of about 15, slender, spreading, 1 cm. long spikes arranged in the upper 5 cm. of the inflorescence, the peduncle and common rachis densely rubiginous-villous, the rachises of the spikes minutely grayish-pubescent or puberulent. Flowers small, 12 to 20 on each spike, 4- rarely 5-merous, sessile, their bracteoles ovate-lanceolate, acuminate, 0.5 mm. long. Calyx cup-shaped, glabrous, 0.8 mm. long, with very obscure, broadly rounded lobes. Petals 4, rarely 5, in bud oblong-elliptic, about 1 mm. long. Anthers oblong. Ovary glabrous.

SARAWAK, without definite locality, *Native collector* 251 (Bur. Sci.).

A characteristic species, readily recognizable by its very slender stems, its small, membranaceous leaflets which are glabrous on the upper surface and rubiginous-pubescent on the nerves and midrib beneath, and by its very slender, small, inflorescences. Its alliance is apparently with *Ampelacissus molleyi*, Planch.

Pterisanthes, Blume.

***Pterisanthes parvifolia*, sp. nov.**

Frutex scandens, tenuis, glaber; *foliis* simplicibus, oblongis, usque ad 7 cm. longis, chartaceis, basi cordatis, apice

acuminatis apiculatisque, margine distanter denticulatis, nervis utrinque 4 vel 5; *receptaculis* longe pedunculatis, oblongis, planis, usque ad 8 cm. longis et 2 cm. latis, basi attenuatis; *floribus* marginalibus utrinque 2 vel 3, longissime pedicellatis; *anemaphroditis* numerosis, utrinque in laminibus inflorescentiae immersis.

A slender, scandent, glabrous plant, the branches terete, 1 to 2 mm. in diameter. Leaves oblong, chartaceous, rather pale when dry, glabrous, somewhat shining, 6 to 7 cm. long, 3 to 3.5 cm. wide, base somewhat cordate, apex acuminate and apiculate, margins with few, usually about three, glandular teeth; lateral nerves 3 or 4 on each side of the midrib, slender, anastomosing, the reticulations rather lax, distinct; petioles 1 to 1.5 cm. long. Special branch bearing the peduncle opposite the leaves, 2 to 4 cm. long, the tendril 4 to 5 cm. long, the peduncle slender, attaining a length of 12 cm. Inflorescence in general oblong, flat, dark-brown when dry, up to 8 cm. long and 2 cm. wide, base attenuate, flat, two-winged, the marginal staminate flowers two or three on each side, their pedicels up to 2 cm. in length, the perfect flowers numerous, scattered over both surfaces of the wings, immersed, in anthesis 2 to 2.5 mm. in diameter, the buds about 1.5 mm. in diameter.

SARAWAK, Baram District, Marudi, *Hose* 213, October 26, 1894.

A species well characterized by its small leaves, and its few, long-pedicelled, marginal flowers. Its alliance is with *Pterisanthes palata*, Miq.

ELAEOCARPACEAE.

Elaeocarpus. Linnaeus.

Elaeocarpus longipetiolatus, sp. nov. § *Ganitrus*.

Arbor circiter 9 m. alta partibus junioribus et foliis subtus ad costa nervisque et inflorescentiis adpresse pubescentibus; *foliis* longe petiolatis (petiolo 3 ad 6 cm. longo), oblongo-ovatis ad oblongo-ellipticis, usque ad 15 cm. longis, prominente acuminatis, basi subacutis, crenulatis, subtus glandulis minutis brunneis dispersis, nervis utrinque 7 vel 8, subtus prominentibus; racemis solitariis, ex axillis defoliatis, circiter 10 cm. longis; *floribus* 5-meris, 6 mm. longis; *sepalis* extus adpresse pubescentibus; *petalis* margine excepto leviter pubescentibus glabris, usque ad mediam partem fissis, segmentis circiter 24, tenuibus; *staminibus* circiter 30, valvis obtusis, longioribus minute barbatis; *ovario* 5-loculare.

A tree about 9 m. high the younger parts, midrib and lateral nerves on the lower surface of the leaves, and the inflorescence with appressed pale-brownish pubescence. Branches

terete, dark-colored, glabrous, above somewhat puberulent, the branchlets densely pubescent. Leaves scattered, oblong-ovate to oblong-elliptic, firmly chartaceous, 10 to 15 cm. long, 5 to 7 cm. wide, the upper surface brownish, glabrous, somewhat shining, the lower paler, softly pubescent on the midrib and lateral nerves, and with scattered, minute, brownish glands over the entire surface, base subacute, apex prominently acuminate, acumen 1 to 1.5 cm. long, blunt, margins crenate, the teeth usually supplied with a short appressed mucro; lateral nerves 7 or 8 on each side of the midrib, prominent, somewhat curved, anastomosing, the reticulations rather lax, distinct; petioles 3 to 6 cm. long, when young densely pubescent, ultimately glabrous; stipules linear, acuminate, about 5 mm. long, densely pubescent except the glabrous, black, mucronate tip, usually with a small lateral lobe from near the base. Racemes about 10 cm. long, solitary from the axils of fallen leaves, pubescent, about 30-flowered, flowers greenish-yellow and white, 5-merous, scattered, ebracteolate, their pedicels slender, about 7 mm. long. Sepals lanceolate, somewhat acuminate, 5 mm. long, 1.8 mm. wide, externally uniformly but not densely appressed-pubescent. Petals in outline obovate-cuneate, 6 mm. long, glabrous except the minutely pubescent margins in the lower part, the upper one-half cut into about 24 filiform fimbriae which are arranged in phalanges of three each, gradually narrowed to the cuneate base. Stamens about 30, their filaments 1 to 1.2 mm. long; anthers oblong, scabrid, 1.2 mm. long, the cells obtuse, one slightly exceeding the other and minutely ciliate, the ciliae usually 3, short, obscure. Disk glands five, globose, prominent, pubescent. Ovary ovoid, pubescent, 5-celled; style thickened below, about 2.5 mm. long. Fruit globose-ellipsoid, about 1.5 cm. in diameter, smooth, the endocarp very hard, smooth, 5-celled, but usually developing only three seeds.

BRITISH NORTH BORNEO, Sandakan, *Villamil 116*, January 2, 1913, in rocky soil near the Government Office, altitude about 17 meters.

A species apparently most closely allied to *Elaeocarpus stipularis*, Blume, which is placed by some authors in the section *Ganitrus*, by others in the section *Dicera*. It differs, however, in very many details of its vegetative characters, its stipules, and its floral characters.

TILIACEAE.

Grewia, Linnaeus.

***Grewia stylocarpa*, Warb., var. *longipetiolata*, var. nov.**

A typo differt petiolis paullo longioribus, circiter 2 cm. longis, glandulis basilaribus glabris, haud barbatis.

BRITISH NORTH BORNEO, Kalabakan watershed, *Villamil* 243, October 8, 1916, in forests, altitude 50 meters.

Grewia stylocarpa, Warb. is a characteristic species of very wide distribution in the Philippines, and the above form comes well within its range of variation except in its longer petioles and its basal glands not being bearded. The fruits of the Bornean form are slightly larger than in most of our Philippine specimens, and regarding it Villamil writes: "fruit yellow when ripe, with a sour taste exactly like *susumbik* (i.e. *Grewia stylocarpa*) of the Philippines."

Columbia, Persoon.

Columbia borneensis, sp. nov.

Arbor circiter 10 m. alta, ramulis hirsutis atque pilis stellatis obtectis; foliis oblongo-ovatis, subcoriaceis, in siccitate fragilibus, pallidis, usque ad 10 cm. longis, tenuiter acumatis, basi plus minusve inaequilateralibus, rotundatis, margine integris vel distanter denticulatis, supra costa nervisque exceptis glabris, subtus densissime minute pallide stellato-puberulis, pilis majoribus stellatis subferrugineis intermixtis, nervis lateralibus utrinque circiter 6, prominentibus, adscendentibus; fructibus obovoideis, 1 ad 1.5 cm. longis, brunneis, ciliato-hirsutis.

A tree about 10 m. high, the branches and branchlets terete, dark-brown, more or less hirsute with slender spreading simple hairs intermixed with much shorter stellate ones. Leaves alternate, subcoriaceous, rather pale when dry, brittle, oblong-ovate, 5 to 10 cm. long, 2.5 to 3.5 cm. wide, sharply acuminate, base more or less inequilateral, rounded, rarely somewhat cordate, one side usually about twice as broad as the other, margins entire or distantly denticulate, the upper surface glabrous except the somewhat pubescent midrib and nerves, the lower pale, very densely and minutely grayish stellate-puberulent, with larger, subferrugineous, stellate hairs intermixed, the base 3-nerved; lateral nerves above the basal pair 4 or 5, all ascending, prominent; petioles hirsute and stellate-pubescent, up to 5 mm. in length. Panicles terminal, hirsute and stellate-pubescent, the lower branches up to 6 cm. in length. Fruits obovoid, 1 to 1.5 cm. long, dark-brown when dry, ciliate-hirsute especially on the cocci, the wings nearly glabrous, apex retuse, base subacute.

BRITISH NORTH BORNEO, Khota Balud to Kibayo, trail to Mount Kinabalu, *Clemens* 9786, October 28, 1915.

The first representative of the genus reported from Borneo, characterised by its rather small, nearly entire leaves.

THYMELAEACEAE.

Wikstroemia, Endlicher.*Wikstroemia clementis*, sp. nov.

Frutex usque ad 4 m. altus partibus junioribus inflorescentiisque plus minusve adpresse pubescentibus exceptis glaber; foliis membranaceis, oblongo-ovatis, usque ad 9 cm. longis, basi acutis, apice tenuiter acute acuminatis, nervis utrinque 7 ad 9, tenuibus, distinctis, anastomosantibus; inflorescentiis terminalibus axillaribusque, breviter pedunculatis, subcapitatis, 3-vel 4-floris; floribus circiter 1 cm. longis, extus parce pubescentibus vel subglabris; ovario oblongo, glabro, stigmate sessile.

A shrub or small tree about 4 m. high, the younger parts and the inflorescence more or less appressed-pubescent with pale hairs, otherwise glabrous. Branches and branchlets slender, terete, reddish-brown. Leaves membranaceous, oblong-ovate, 6 to 9 cm. long, 2 to 4 cm. wide, base acute, apex slenderly and sharply acuminate, shining, greenish or brownish when dry; lateral nerves 7 to 9 on each side of the midrib, slender, distinct, anastomosing, the reticulations rather distinct; petioles glabrous, 3 to 4 mm. long. Inflorescences axillary and terminal, subcapitately 3- or 4-flowered, the peduncles appressed-pubescent, 3 to 7 mm. long. Flowers yellowish, the tube 1 cm. long, externally very slightly pubescent or nearly glabrous, in one form distinctly pubescent, the lobes 4, the outer two up to 3 mm. long, obtuse, oblong-ovate, the inner two elliptic, somewhat shorter than the outer ones. Anthers 8, 2-seriate, four inserted near the mouth of the tube, four inserted 2 to 3 mm. below the throat. Ovary oblong, glabrous, about 3 mm. long; style very short; stigma capitate. Disk-scales 0.5 to 1 mm. long.

BRITISH NORTH BORNEO, Mount Kinabalu, Kian, *Clemens* 9964, November 2, 1915 (type); Lobang, *Clemens* 10419, November, 1915, a form with the perianth-tube rather prominently pubescent.

The alliance of this species is with the Philippine *Wikstroemia orata*, Mex., from which it is distinguishable by its shorter flowers and slenderly acuminate leaves.

Wikstroemia acuminata, sp. nov.

Frutex circiter 1.5 m. altus, inflorescentiis paucissime adpresse pubescentibus exceptis glaber; ramis ramulisque tectibus, tenuibus, in siccitate rubro-brunneis; foliis lanceolatis, usque ad 15 cm. longis, chartaceis, tenuiter acute acuminatis, basi acutis, supra subolivaceis, nitidis, subtus pallidis, subalbidis, nervis primariis utrinque circiter 10, indistinctis; inflorescentiis axillaribus terminalibusque brevissimis, ut videtur

paucifloris: *fructibus* ovoides, in siccatate circiter 8 mm. longis.

A shrub about 1.5 m. high, entirely glabrous except the very sparingly appressed-pubescent inflorescences. Branches and branchlets slender, terete, smooth, reddish-brown. Leaves lanceolate, 12 to 15 cm. long, 3.5 to 4 cm. wide, chartaceous, gradually narrowed from below the middle to the slenderly acuminate apex, the base acute, the upper surface subolivaceous, shining, the lower dirty white, dull, lateral nerves very indistinct, the primary ones about 10 on each side of the midrib, curved, rather more distinct on the upper than on the lower surface; petioles 3 to 4 mm. long. Inflorescences axillary and terminal, few, possibly only one-flowered, the peduncles about as long as the petioles. Flowers not seen. Fruit yellow when mature, fleshy, when dry ovoid, about 8 mm. long, nearly black in color, somewhat shining.

BRITISH NORTH BORNEO, Sandakan, *Ulu'um'* 187, March 21, 1916, in forests beyond the Reservoir, altitude about 100 meters.

A species well characterized by its lanceolate, slenderly acuminate leaves which are whitish on the lower surface. It may be allied to *Wikstroemia pillica*, Gamble, which has been reported from Sandakan by Miss Gibbs, but is very different from that form as described.

Wikstroemia subcoriacea, sp. nov.

Frutex usque ad 2 m. altus, glaberrimus, ramulis junioribus leviter compressis; foliis oppositis, anguste oblongis, subcoriaceis, circiter 4 cm. longis, utrinque acutis, nervis utrinque circiter 5, haud prominentibus; inflorescentiis axillaribus terminalibusque, cernuis, pedunculatis, paucifloris, *thoribus* glabris, capitato-racemose dispositis, tubo circiter 8 mm. longo; *antheris* glabris; *squamis* hypogynis linearibus, circiter 1 mm. longis.

A shrub about 2 m. high, entirely glabrous. Branches terete, usually reddish-brown, the branchlets darker in color, more or less compressed or somewhat angular, the internodes on the branchlets 1 cm. long or less. Leaves opposite, somewhat crowded toward the tips of the branchlets, narrowly oblong, about 4 cm. long, 10 to 12 mm. wide, greenish-olivaceous when dry, the lower surface sometimes somewhat glaucous, acute at both ends, subcoriaceous; lateral nerves about 5 on each side of the midrib, not prominent, obscurely anastomosing; petioles 2 to 3 mm. long. Inflorescences axillary and terminal, their peduncles less than 1 cm. long, cernuous, stiff, persistent, bearing usually about 5 racemose-capitate flowers. Flowers greenish-yellow, glabrous, their pedicels distinct but 1 mm. in length or less, the tube about 8 mm. long; lobes

oblong elliptic, obtuse, 2 to 2.5 mm. long. Stamens 8, two-seriate, all included, the upper four anthers about one-half as long as the lower four, the filaments slender, distinct. Ovary oblong, about 3 mm. long, glabrous, narrowed upward, the style about 0.5 mm. long, the stigma capitate; disk-scales linear, distant in pairs, about 1 mm. long.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Spur, *Clemens* 11075, December 1, 1915, in an open place above the cave. Apparently referable here is a sterile specimen, *Clemens* s.n., from the same general locality, which differs from the type in having its leaves up to 7 cm. in length.

MELASTOMATACEAE.

Dissochaeta, Blume.

Dissochaeta glabra, sp. nov. § *Disparistemones*, sect. nov.

Frutex scandens, glaber: *foliis* chartaceis, nitidis, superioribus oblongis vel oblongo-ellipticis, basi acutis vel retundatis, inferioribus majoribus, usque ad 15 cm. longis et 10 cm. latis, ovato-ellipticis, basi leviter cordatis, 5- vel obscure 7-nerviis, apice abrupte acuminatis: *paniculis* terminalibus, usque ad 25 cm. longis, multifloris: *floribus* 4-meris, calyci truncato; *petalis* circiter 3.5 mm. longis: *staminibus* 8, valde inaequalibus, *antheris* majoribus antice breviter biappendiculatis appendicibus circiter 1 mm. longis, postice breviter appendiculatis: minoribus (sterilibus) antice appendicibus 2 filiformibus circiter 3.5 mm. longis instructis.

A scandent glabrous shrub, or the younger parts of the inflorescence very slightly and obscurely furfuraceous. Branches subhyaccous, smooth, terete, or the younger ones slightly compressed. Leaves opposite, chartaceous, brittle when dry, olivaceous, shining, glabrous, prominently and abruptly acuminate, the upper ones smaller than the others, oblong to oblong-elliptic, base subacute to rounded, the lower ones ovate-elliptic, slightly cordate, up to 15 cm. long and 10 cm. wide, all 5- or obscurely 7-nerved, entire, the longitudinal and transverse nerves prominent; petioles 1.5 to 2 cm. long, their margins somewhat tuberculate. Panicles terminal, ample, narrowly pyramidal, about 25 cm. long, the branches opposite, distant, the lower ones about 11 cm. long. Flowers white, 4-merous, in 3- to 5-flowered umbels at the tips of the ultimate branchlets, bracts and bracteoles none, the pedicels 2 to 3 mm. long. Calyx about 3.5 mm. long, 2.5 mm. in diameter, base acute, apex truncate, very obscurely 4-denticulate, the limb produced about 1.5 mm. Petals 4, inequilaterally obovate, about 3.5 mm. long, subacute. Fertile stamens 4, their filaments flattened, about 5 mm. long, the anthers almost S-shaped, as long as the filaments, somewhat

rostrate-acuminate, the connectives not produced, the anterior appendages less than 1 mm. long, thin, the dorsal appendage thin, membranaceous, about as long as the anterior ones; sterile filaments much shorter than the fertile ones, each with a pair of slender, filiform, reflexed, 3 to 3.5 mm. long appendages at the apex.

BRITISH NORTH BORNEO, Kalabakan watershed, along the Pinagas River, *Villand* 242, October 8, 1916, altitude about 20 meters.

An anomalous species on account of its fertile anthers lacking the long filiform anterior appendages, which, however, are present at the apices of the sterile filaments. It agrees best with the characters of the § *Dialostemonus* but on account of the short anterior and posterior appendages of the fertile anthers, and the filiform appendages of the sterile filaments, I have made it the type of a new section, *Disdialstemonus*.

HALORRHAGACEAE.

Halorrhagis, Forster.

***Halorrhagis scabra*, (Koenig) Benth., var. *elongata*, Schradl. in Engl. Pflanzenreich, 25 (1905) 20.**

BRITISH NORTH BORNEO, Jesselton, *Tapiant* 1354, October, 1915, a common weed along roadsides.

Southern China and the Philippines, with a variety in India.

ERICACEAE.

Vaccinium, Linnaeus.

***Vaccinium clementis*, sp. nov.**

Frutex vel arbor usque ad 12 m. altus, glaucus; *foliis* oblongo-obovatis, usque ad 3.5 cm. longis, apice rotundatis, basi cuneatis, integris, subtus punctulatis, nervis utrinque 2 vel 3, adsculptis, obscuris; *racemis* in axillis superioribus, 1.5 ad 3 cm. longis, paniculosis, *floribus* circiter 1 cm. longis; *corolla* leviter imbricata, sursum leviter angustata; *filamentis* villosis; *antheris* 1 mm. longis, dorso minute 2-auristatis, appendicibus tubulosis, latis.

A shrub or tree attaining a height of 12 m. glaucous or nearly so. Branches slender, terete, reddish-brown or somewhat grayish, smooth, the branchlets somewhat angular. Leaves alternate, coriaceous, entire, brownish or olivaceous when dry, shining, oblong-obovate, 2 to 3.5 cm. long, 0.8 to 1.5 mm. wide, apex rounded, base gradually narrowed from above the middle, cuneate, margins somewhat recurved, the lower surface more or less glandular-punctulate; midrib

rather distinct on the lower surface, the lateral nerves 2 or 3 on each side of the midrib, mostly basal or sub-basal, sharply ascending, slender, anastomosing, not prominent; petioles about 1 mm. long. Racemes solitary in the upper axils, glabrous or very obscurely pubescent, 1.5 to 3 cm. long, few-flowered, rarely more than 6 flowers in a raceme, the pedicels about 5 mm. long, spreading or somewhat recurved, slightly elongated in fruit. Flowers white, about 1 cm. long, cylindric or subcylindric. Calyx somewhat turbinate, about 3 mm. long, very slightly pubescent, the teeth 5, orbicular-ovate, rounded, about 1 mm. long. Corolla glabrous externally, somewhat villous inside, 8 to 9 mm. long, slightly inflated, slightly narrowed upward, the lobes 5, recurved, orbicular or orbicular-ovate, rounded, about 1 mm. long. Stamens 10; filaments villous, about 2.5 mm. long; anthers about 1 mm. long, minutely 2-awned on the back, the appendages tubular, short, broad. Top of the ovary densely villous; style about 8 mm. long, villous except the upper one-fourth. Immature fruits ovoid, about 4 mm. long, glabrous except the tip inside the calyx-teeth which is densely villous.

SARAWAK, Mount Santubong, *Nature collector* 2235 (type); Mt. Poe, *Forsworth* 204, May, 1908, summit altitude 1300 m.; DU RUI BORNEO, G. Kelam, *Hallier* 2426, doubtfully identified as *Vaccinium bacitolum* Hook. f. as a variety; BRITISH NORTH BORNEO, Mount Kinabalu, Gurulau Spur, *Chems* s.n., November 8, 1915, sterile.

The specimens resemble *Vaccinium variegatifolium*, Miq. and *V. lucidum*, Miq., in many features, but the species is distinguished by its vegetative and floral characters. It is apparently most closely allied to the Philippine *Vaccinium palawanense*, Merr., but has smaller, differently shaped leaves and somewhat larger flowers. It is not closely allied to *Vaccinium bacitolum*, Hook. f., of which I have excellent specimens from the type locality, *Chems* 10625.

***Vaccinium caudatifolium*, sp. nov.**

Frutex vel arbor partibus junioribus inflorescentisque exceptis glaber; *foliis* coriaceis, lanceolatis, vel oblongo-lanceolatis, usque ad 15 cm. longis, integris, in scottate olivaceis vel brunneo-olivaceis, utrinque nitidis, laevibus, concoloribus, apice tenuissime caudato-acuminatis, basi acutis, nervis utrinque 4 vel 5, adscendentibus, tenuissimis, utrinque obscuris; *racemis* axillaribus, solitariis vel fasciculatis, tenuibus, usque ad 5 cm. longis, laxifloris; *floribus* minutis, ciriter 2.5 mm. longis, ellipsoideis, 5-angulatis; *antheris* dorso minute 2-aristatis, appendicibus tenuissimis, ciriter 2 mm. longis.

A shrub or tree, the branchlets and inflorescence somewhat pubescent with short brownish hairs, otherwise glabrous. Branches slender, terete, reddish-brown, sparingly lenticellate.

the branchlets very slender, somewhat angled, puberulent. Leaves numerous, alternate, coriaceous, smooth, shining, lanceolate to oblong-lanceolate, entire, 9 to 15 cm. long, 2 to 4 cm. wide, base acute, apex very slenderly and sharply caudate-acuminate, the acumens up to 3 cm. in length, both surfaces brownish-olivaceous or olivaceous when dry; midrib prominent, impressed on the upper surface; lateral nerves very slender, obscure, sharply ascending, 4 or 5 on each side of the midrib, rather more distinct on the upper than on the lower surface, obscurely anastomosing, the reticulations lax, obscure, or nearly obsolete; petioles 2 to 3 mm. long, when young puberulent, in age glabrous. Racemes axillary, solitary or fascicled, slender, lax, up to 5 cm. in length, brownish-puberulent. Flowers scattered, small, subelliptic, about 2.5 mm. long, their pedicels slender, about 6 mm. long, the bracts lanceolate to oblong-lanceolate, sharply acuminate, 2.5 to 3.5 mm. long, somewhat puberulent, the bracteoles two, linear-lanceolate, acuminate, 1.6 mm. long, borne on the lower one-half of the pedicel. Calyx puberulent, the tube globose, about 1 mm. in diameter, the lobes 5, oblong, acuminate, somewhat spreading, puberulent, 1 mm. long. Corolla-tube ellipsoid, somewhat 5-angled, glabrous, about 2 mm. long and 1.5 mm. in diameter, slightly contracted at the throat, the 5 lobes oblong, obtuse, recurved, less than 1 mm. long. Stamens 10; filaments pubescent, about 1 mm. long; anthers about 1.3 mm. long, inflated below, the back minutely 2-spurred, the appendages very slender, about 1 mm. long. Top of the ovary pubescent. Young fruit somewhat turbinate, sparingly pubescent, truncate, about 3 mm. in diameter.

SARAWAK, *Native collector* 1679 (type), 2792 (Bur. Sci.), the former without definite locality, the latter from Liu-Matu, Baram, November 1, 1914.

A very characteristic species, readily distinguished by its obscurely nerved, very slenderly and sharply caudate-acuminate leaves and its small flowers. It resembles *Vaccinium dunalianum*, Wight, of British India, but differs from that species in numerous characters.

***Vaccinium elliptifolium*, sp. nov.**

Ut videtur tritex erectus, foliis subtus in costa et petiolis ramulisque junioribus pubescentibus, inflorescentibus cinereo-villosis; foliis ellipticis, crasse coriaceis utrinque subaequaliter reticulatis, apice retusis, 2 ad 4 cm. longis, olivaceis, nitidis, subtus obscure glandulosis, nervis utrinque 3 vel 4, adscendentibus, tenuibus; racemis 2 ad 3 cm. longis, axillaribus, solitariis, bracteis aciculatis, minutis; floribus 5-meris, circiter 12 mm. longis; calycis lobis circiter 2 mm. longis, chartatis, obtusis; corolla circiter 9 mm. longa, extus glabra, intus leviter villosa, sursum angustata; filamentis villosis; antheris

oblongis, hand aristatis, appendicibus brevissimis, latis, truncatis: *fructibus* junioribus cinereo-villosis.

Apparently an erect shrub, the branchlets, lower surface of the leaves along the midrib, and the petioles distinctly pubescent, the inflorescences rather prominently cinereous-villous. Branches dull-brownish, terete, glabrous. Leaves rather crowded, thickly coriaceous, elliptic, entire, 2 to 4 cm. long, 1.3 to 2 cm. wide, subequally rounded at base and apex, the apex retuse, olivaceous and shining when dry, the lower surface somewhat paler than the upper, obscurely glandular-punctate; lateral nerves 3 or 4 on each side of the midrib, sharply ascending, slender, rather distinct on the lower surface, obscurely anastomosing; petioles stout, about 2.5 mm. long. Racemes axillary, solitary, 2 to 3 cm. long, 6- to 10-flowered, rather prominently cinereous-villous, the pedicels about 5 mm. long, the bracts acicular, 1 to 1.5 mm. long, deciduous. Flowers apparently red, about 12 mm. long. Calyx-tube ovoid-globose, about 2.5 mm. in diameter, villous, the segments 5, ovate, obtuse, villous, about 2 mm. long. Corolla about 9 mm. long, about 3 mm. in diameter below, narrowed upward, the mouth contracted, glabrous outside, somewhat villous inside, the lobes somewhat spreading or recurved, ovate, obtuse, about 1 mm. long. Stamens 10; filaments villous, 3 mm. long; anthers oblong, 1.5 mm. long, not spurred, the appendages stout, broad truncate, scarcely 0.5 mm. long, the two together as wide as the basal part of the anther. Style 8 to 9 mm. long, villous in the lower one-half or two-thirds. Young fruits ovoid-globose, rather densely cinereous-villous, crowned by the erect calyx-lobes.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Clemens* 10894, 11099, the former in flower, November 22, the latter in young fruit, December 2, 1915.

A characteristic species easily recognizable by its rather small, thickly coriaceous, elliptic, somewhat retuse leaves, and its prominently cinereous-villous racemes.

***Vaccinium sarawakense*, sp. nov.**

Frutex (vel arbor), inflorescentiis obscure castaneo-glanduloso-pubescentibus, exceptis glaber; *foliis* ellipticis, coriaceis, in siccitate pallidis, utrinque subaequaliter angustatis, basi acutis, apice acuminatis, usque ad 9 cm. longis, nervis primariis utrinque 2 vel 3, tenuibus, adscendentibus; racemis axillaribus, 3 ad 6 cm. longis; *bracteis* acicularibus, circiter 2 mm. longis, caducis; *floribus* 5-meris, circiter 8 mm. longis; *corolla* sursum angustata, extus glabra intus puberula; *antheris* dorso minute 2-aristatis, appendicibus tubulosis, 1 mm. longis, truncatis; *stylis* glabris.

A shrub or tree quite glabrous except the racemes which are supplied with short, scattered, chestnut-brown, blunt,

gland-like hairs. Branches terete, reddish-brown, sometimes grayish, the branchlets somewhat angled. Leaves thickly coriaceous, pale, slightly shining when dry, elliptic, 6 to 9 cm. long, 3 to 4 cm. wide, subequally narrowed to the shortly acuminate apex and the acute or somewhat acuminate base, the margins entire, usually with a pair of marginal glands at the junction with the petiole, the lower surface very obscurely glandular: primary lateral nerves two or three on each side of the midrib, slender, ascending, obscurely anastomosing, the reticulations lax, not prominent: petioles 5 to 7 mm. long. Racemes axillary, solitary, 3 to 6 cm. long, the flowers 5-merous, rather numerous, about 8 mm. long: bracteoles acicular, caducous, about 2 mm. long: pedicels 4 to 5 mm. long. Calyx about 4 mm. in diameter, shallow, sparingly pubescent or glabrous, the lobes broadly triangular-ovate, acute or obtuse, about 1 mm. long, their margins usually obscurely ciliate with very short hairs. Corolla about 8 mm. long, narrowed upwards, the mouth contracted, below about 2.5 mm. in diameter, glabrous externally, puberulent inside, the lobes erect or somewhat spreading, ovate, obtuse, 1 mm. long. Stamens 19; filaments 3 mm. long, inflated below, villous; anthers oblong, 2 mm. long, the two dorsal awns minute, 0.2 mm. long, the appendages 1 mm. long, cylindric, truncate. Disk prominent, glabrous. Style glabrous, about 1 mm. long.

SARAWAK, Kuching, *Native collector* 2757, (Bur. Sci.), Feb.-June, 1914, the flowers indicated as white.

Probably as closely allied to *Vaccinium ellipticum*, Miq., as to any other species, but readily distinguished by its less-nerved leaves and its floral characters.

***Vaccinium hosei*, sp. nov.**

Species 17, *sarawakensis* affinis, differt foliis paullo majoribus, nervis primariis utrinque 4 vel 5, subtus prominentibus, reticulis distinctis, antheris dorso haud aristatis.

A shrub or tree quite glabrous except the racemes which are sparingly pubescent with dark-brown, gland-like, short, blunt hairs. Leaves thickly coriaceous, when dry rather pale on the upper surface, brownish on the lower surface, slightly shining, 7 to 11 cm. long, 3.5 to 5 cm. wide, elliptic, base acute, usually with two marginal glands, apex shortly blunt-acuminate, entire: lateral nerves 4 or 5 on each side of the midrib, rather prominent, ascending, anastomosing, the reticulations lax, rather distinct: petioles stout, 5 to 8 mm. long. Racemes axillary, about 6 cm. long, rather few-flowered, the bracts acicular, 2 to 3 mm. long, deciduous, the pedicels about 5 mm. long. Flowers 5-merous, the corolla narrowly ovoid, narrowed upward, glabrous externally, very obscurely pubescent inside, about 8 mm. long, the lobes ovate, obtuse, 1 mm. long. Stamens 19; filaments 3.5 mm. long, inflated below,

villous, the upper one-fourth glabrous: anthers oblong, somewhat flexed in the middle, 2 mm. long, the dorsal awns obsolete, the appendages cylindric, truncate, about 1 mm. long. Disk prominent, glabrous: style about 9 mm. long, somewhat exerted in anthesis, glabrous.

SARAWAK, Baram, *Hose 236*, December, 1894.

The alliance of this species is manifestly with *Vaccinium sarawakense*, Merr., in spite of the fact that the anthers are not awned. It differs from *V. sarawakense*, Merr., notably in its more numerous, much more prominent lateral nerves and more prominent reticulations.

Diplycosia, Blume.

Diplycosia ensifolia, sp. nov.

Frutex epiphyticus, floribus paucissime pubescentibus exceptis glaber: *foliis* lanceolatis vel lineari-lanceolatis, usque ad 20 cm. longis et 1.5 cm. latis, coriaceis, acuminatis, laevibus, basi obtusis vel rotundatis, obscure triplinerviis: *floribus* axillaribus, solitariis vel binis, breviter pedicellatis (pedicello circiter 4 mm. longo): *bracteis* reniformibus: *calyce* circiter 5 mm. longo, lobis erectis, ovatis, obtusis: *corolla* ut videtur obovoidea, 5 mm. longa.

An epiphytic shrub, entirely glabrous except the sparingly pubescent flowers. Branches terete, smooth, dark-colored when dry. Leaves alternate, thickly coriaceous, rigid, lanceolate to linear-lanceolate, olivaceous or pale, usually somewhat shining when dry, smooth, 13 to 20 cm. long, 1.2 to 1.8 cm. wide, straight or slightly falcate, base rounded or obtuse, obscurely 3-plinerved, gradually narrowed upward to the slenderly acuminate apex, the midrib and on the larger leaves the basal nerves impressed on the upper surface, on smaller leaves the basal nerves obsolete or nearly so, reticulations obsolete; lateral basal pair of nerves in larger leaves extending nearly to the apex of the leaf as marginal nerves, obsolete on the lower surface; lower surface with scattered, punctate, dark-colored glands; petioles stout, channeled on the upper surface, up to 3 mm. in length. Flowers white tinged with dull lavender, axillary, solitary or in pairs, their pedicels about 1 mm. long, very slightly pubescent, the bracts at the apex of the pedicels two, reniform, rounded, 1.2 mm. long, 2.2 mm. wide, margins obscurely short-ciliate. Calyx-tube somewhat funnel-shaped, the lobes 5, erect, ovate, obtuse, 2 mm. long, their margins obscurely short-ciliate. Corolla apparently obovoid, glabrous, 5 mm. long, the orifice round, about 2 mm. in diameter. Stamens 10; filaments glabrous, 2 mm. long; anthers oblong-ovoid, 1.5 mm. long. Ovary globose, glabrous; style 2.5 mm. long. Fruit "white" (not seen).

BRITISH NORTH BORNEO, Mount Kinabalu, Marau Para Spur, *Chromola 11027*, December 1, 1916, epiphytic.

A most characteristic species, at once distinguished from all described forms by its very long, narrow, thickly coriaceous leaves.

***Rhododendron*, Linnaeus.**

***Rhododendron lineare*, sp. nov.**

Frutex (torsan epiphyticus), ramulis junioribus et totis subtus et floribus perspicue castaneo-lepidotis; *foliis* linearibus, 3.5 ad 4 cm. longis, 3 ad 5 mm. latis, pseudoverticillatis, obtusis, coriaceis, costa prominentibus, nervis reticulisque obsolete; *floribus* circiter 2 cm. longis, campanulato-infundibuliformibus, profunde 5-lobatis, extus lepidotis.

A shrub, perhaps epiphytic, strongly characterized by its very narrow, small leaves. Branches slender, terete, glabrous, irregular, the branchlets densely lepidote, the scales dark-brown, prominent. Leaves verticillate or pseudoverticillate, coriaceous, linear, 3.5 to 4 cm. long, 3 to 5 mm. wide, obtuse at both ends, margins somewhat recurved, brownish-olivaceous, shining, the midrib prominent, impressed on the upper surface, the nerves and reticulations wholly obsolete, the lower surface prominently lepidote, the scales occupying small pits; petioles densely lepidote, 1 to 2 mm. long. Flowers terminal, apparently each inflorescence with 3 or 4 flowers, their pedicels about 8 mm. long, very densely covered with rather large, round, easily detached, dark-brown scales. Calyx disk-like, small, lepidote. Corolla about 2 cm. long, campanulate-infundibuliform, the tube cylindric, about 7 mm. long, externally densely brown-lepidote, the lobes elliptic-oblong, about 12 mm. long and 7 mm. wide, rounded, the median portion in the lower one-half with scattered round scales. Stamens 10; filaments very slender, villous at the base; anthers narrowly oblong, 3 mm. long. Ovary and style about 2 cm. long, very densely lepidote, the scales round, rather large, dark-brown, easily detached, the upper part of the style nearly glabrous.

SARAWAK, without definite locality, *Native collector 1161* (Bur. Sci.).

A most characteristic species, at once distinguished from all described forms by its small, linear, very narrow, coriaceous leaves.

***Rhododendron kinabaluense*, sp. nov.**

Frutex vel *arbor parva*; *ramulis* junioribus plus minusve brunneo-lepidotis; *foliis* verticillatis, ellipticis vel oblongo-ellipticis, coriaceis, usque ad 12 cm. longis, apice obtusis vel obscure latissime obtuse acuminatis, basi acutis vel obtusis,

marginē recurvatis, supra glabris, subtus plus minusve lepidotoglandulosis, nervis utrinque circiter 8, subpatulis, prominentibus, anastomosantibus, reticulo laxo: *floribus* hypocrateriformibus, extus cum pedicellis distincte pubescentibus: *tubo* cylindrico, circiter 2 cm. longo, lobis obovatis, rotundatis, circiter 12 mm. diametro: *filamentis* basi villosis: *ovario* oblongo, dense pubescente, stylo glabro.

A shrub or small tree, the branches and branchlets terete, grayish or brownish, the former glabrous, the latter with numerous, subdeciduous, dark-brown scales. Leaves verticillate, usually in threes, thickly coriaceous, elliptic to oblong-elliptic, 8 to 12 cm. long, 4 to 5.5 cm. wide, subequally narrowed to the acute or obtuse base and to the blunt or obscurely and broadly blunt-acuminate apex, the upper surface olivaceous, slightly shining, the lower pale-brownish, with numerous, small, dark-brown, scattered scales sunk in minute pits; midrib very prominent on the lower surface, impressed on the upper surface; lateral nerves about 8 on each side of the midrib, spreading, somewhat curved-anastomosing, very prominent on the lower surface, the reticulations lax, prominent; petioles, when young, lepidote, in age glabrous, stout, 1 to 1.5 cm. long. Heads with about six, pink-purple, apparently nodding, pubescent flowers, the pedicels about 2.5 cm. long, rather densely pubescent with short, spreading, pale hairs. Calyx disk-like, about 2.5 mm. in diameter. Corollatube cylindric, about 2 cm. long, 8 mm. wide when flattened, uniformly and prominently pubescent with short, pale, spreading hairs as are the lobes on the back, the lobes obovate or reniform-obovate, about 12 mm. in diameter, broadly rounded. Stamens 10; filaments densely pubescent in the lower 6 mm., otherwise glabrous; anthers oblong, 3 mm. long. Ovary densely pale-pubescent, oblong, about 5 mm. long; style nearly 2 cm. long, glabrous.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Clemens* 19892, November 22, 1915, altitude probably about 2400 meters.

A species well characterized by its salver-shaped, pubescent flowers, pubescent pedicels, lepidote branchlets, and thickly coriaceous, verticillate leaves which are rather prominently lepidote-glandular on the lower surface, the scattered, small, dark-brown scales being sunk in minute pits.

***Rhododendron obscurinervium*, sp. nov.**

Frutex vel arbor partibus junioribus foliisque subtus parce castaneo-lepidotis, exceptis glaber: *foliis* pseudoverticillatis, coriaceis, lanceolatis vel anguste lanceolatis, usque ad 20 cm. longis et 3.3 cm. latis, utrinque angustatis, basi acutis, apice tenuiter acute acuminatis, in senectute brunneis, nervis utrinque circiter 18, supra obscuris, subtus obsolete vel subobsolete;

floribus tubuloso-campulatis, 3 ad 4 cm. longis, glabris, lobis ellipticis, tubo subcampanulatis, bracteolis 1 vel 2, linearibus, usque ad 2 cm. longis, deciduis.

A shrub or small tree, nearly glabrous except the sparingly castaneous-lenticulate younger parts and lower surface of the leaves. Branches terete, grayish, smooth, the branchlets reddish-brown, smooth, the younger parts more or less lepidote. Leaves lanceolate to narrowly lanceolate, pseudocostate, brown when dry, dull or slightly shining, 10 to 20 cm. long, 1 to 3.5 cm. wide, narrowed below to the acute base and above to the gradually and slenderly acuminate apex, the midrib impressed on the upper surface, very prominent on the lower, the latter with few, scattered, dark-brown scales, ultimately glabrous or nearly so; lateral nerves about 18 on each side of the midrib, obsolete or nearly so on the lower surface, on the upper surface slender, obscure, irregular, obscurely anastomosing, or on small leaves quite obsolete; petioles stout, brown or pruinose, when young sparingly lenticate, 4 to 10 mm. long. Heads with at least five flowers, the interrupted bracts up to 2 cm. long, linear, the pedicels about 2 cm. in length, very sparingly lepidote, ultimately glabrous. Calyx disk-like, about 5 mm. in diameter, each flower subtended by two, rarely one, linear, deciduous bracteoles nearly 2 cm. in length, apically five greatly elongated calyx-lobes. Corolla glabrous, tubular-campuluate, the tube 1.5 to 2 cm. long, slightly enlarged toward the lobes 5, elliptic or narrowly elliptic, about as long as the tube, about 1 cm. wide, rounded. Stamens 10; filaments sparingly pubescent in the lower one-half, anthers oblong, 3.5 mm. long. Ovary narrowly ovoid, about 1 mm. long, sparingly pubescent; style glabrous, about 1.6 cm. long.

SARAWAK, without definite locality, *Nature collector* 1504 (Bur. Sci.).

A species apparently allied to *Rindolandean gracile* Low, but with relatively much narrower leaves, very sparse scales, the older parts quite glabrous, and smaller flowers.

SYMPLOCACEAE.

Symplocos, Jacquin.

Symplocos brachybotrys, sp. nov. § *Bolua* (*Lobelia*!).

Frutex vel arbor parva, partibus junioribus piloscentibusque parvisque tubulosisque exsertis glaber, ramis ramulisque brunnis, teretibus; *foliis* ellipticis, usque ad 5 cm. longis, coriaceis, basi acutis vel subacutis, apice rotundatis vel late acutis, apiculatisque, hinc acuminatis, margine glanduloso-denticulatis, nervis utriusque circiter 6, distinctis, anastomosantibus; *spicis* axillaribus, solitariis, brevissimis, rhachibus circiter 3 mm. longis, 3-4-floris; *bracteis* oblongis, circiter

3 mm. longis, junioribus extus parvissime adpresse hirsutis, calycis lobis elliptico-ovatis, obtusis, plerumque patulis, circiter 2 mm. longis.

A shrub or small tree, nearly glabrous, or the branchlets and inflorescences very sparingly appressed-pubescent. Branches and branchlets terete, dark reddish-brown, somewhat shining, rather slender. Leaves scattered, coriaceous, elliptic, 3 to 5 cm. long, 2.3 to 4 cm. wide, pale yellowish-green when dry, shining, base acute or subacute, apex broadly rounded to somewhat acute, often apiculate, never acuminate, margins minutely glandular-denticulate, the very small teeth nearly obsolete below; lateral nerves about 6 on each side of the midrib, distinct, curved-anastomosing, the reticulations evident; petioles 3 to 4 mm. long, when very young slightly pubescent, ultimately glabrous. Inflorescences reduced to a 1- to 3-flowered, axillary, solitary, very short spike, the rachis sparingly pubescent, up to 3 mm. in length, bearing a single fruit, rarely two, and the scars of one or two fallen fruits. Young fruit oblong, very slightly pubescent, sessile, about 3 mm. long, the calyx-lobes usually spreading, obtuse to rounded, elliptic-ovate, about 2 mm. long, sparingly ciliate.

BRITISH NORTH BORNEO, Mount Kinabalu, Marai Parai Spur, *Clemens 10961*, in an open place, altitude not indicated, the fresh fruits dull purplish-red.

A most characteristic species readily recognizable by its elliptic, usually rounded leaves, and its very abbreviated axillary, solitary spikes, these usually bearing but a single fruit.

***Symplocos clementis*, sp. nov. § *Bobua*, *Lodhra*.**

Frutex circiter 4 m. altus, partibus junioribus dense sordide fusco-pubescentibus: foliis oblongis vel oblongo-lanceolatis, coriaceis, usque ad 3.5 cm. longis, basi acutis, apice acute acuminatis, margine plerumque valde reflexis, glanduloso-serrulatis, supra glabris, nitidis, subtus plus minusve adpresse pubescentibus praesertim in costa nervisque, nervis lateralibus utrinque 7 ad 9; floribus axillaribus, solitariis, pedicellatis, circiter 8 mm. diametro; bracteis oblongo-lanceolatis, acuminatis, 3 ad 4 mm. longis; fructibus oblongo-ellipsoideis, junioribus leviter adpresse pubescentibus, vetustioribus glabris, nigro-purpureis, circiter 1 cm. longis.

A shrub about 4 m. high, the young branchlets densely appressed-pubescent with dirty brown hairs, the branches slender, terete, brownish, glabrous. Leaves coriaceous, oblong to oblong-lanceolate, 2 to 3.5 cm. long, 5 to 15 mm. wide, the upper surface greenish-olivaceous, somewhat shining, glabrous, the lower paler, appressed-pubescent especially on the midrib and lateral nerves, the base acute, apex sharply acuminate, margins usually strongly reflexed and sharply glandular-

serrate, the midrib impressed on the upper surface; lateral nerves 7 to 9 on each side of the midrib, slender, distinct, anastomosing; petioles pubescent, 1 to 2 mm. long. Flowers white, axillary, solitary, about 8 mm. in diameter, their pedicels pubescent, 5 to 6 mm. long, each with two, oblong-lanceolate, acuminate, pubescent, 3 to 4 mm. long, deciduous bracteoles subtending the flower. Calyx somewhat campanulate, pubescent, the lobes 5, broadly ovate, rounded, about 1 mm. long, margins minutely ciliate. Petals orbicular-ovate, rounded, 4 mm. long. Stamens about 40; filaments 3 to 5 mm. long. Young fruits sparingly appressed-pubescent, narrowly oblong, at maturity nearly black, glabrous, oblong-ellipsoid, about 1 cm. long, the pericarp fleshy.

BRITISH NORTH BORNEO, Mount Kinabalu, Paka Cave, *Clemens* 16559, November 12, 1915, along streams, altitude about 3000 meters.

A species in the same group with, and allied to *Symplocos johniana*, Stapf, and *S. zigzyphoides*, Stapf, and distinctly closer to the latter from which it is distinguished especially by its smaller leaves which are acute at the base.

***Symplocos phanerophlebia*, Merr. in Philip. Journ. Sci. 9 (1914) Bot. 382.**

BRITISH NORTH BORNEO Sandakan, *Villamil* 182, March 16, 1913, on hills beyond the Wireless Station, altitude about 40 meters.

The specimen is an excellent match for the type of the species, which was from Leyte. It is distinct from *Symplocos fusciculata*, Zoll., of which I have a large series of specimens from the Malay Peninsula, Java, and Borneo.

CONVOLVULACEAE.

***Merremia*, Dennstedt.**

***Merremia hederacea*, (Burm.) Hallier f. in Engl. Bot. Jahrb. 18 (1894) 118.**

Evobulus hederaceus, Burm. Fl. Ind. (1768) 77.

Merremia convolvulacea, Dennst. Schl. Hort. Malabar, (1818) 39.

BRITISH NORTH BORNEO, Jesselton, *Topping* 1944, November, 1916.

Tropical Asia and Africa through Malaya to the Philippines and north eastern Australia.

VERBENACEAE.

Callicarpa, Linnaeus.***Callicarpa fulvohirsuta*, sp. nov.**

Frutex, ramis ramulisque dense fulvo stellato-pubescentibus, pilis hirsutis fulvis additis: *foliis* chartaceis, oblongo-ellipticis, usque ad 14 cm. longis, utrinque subaequaliter angustatis, apice acute acuminatis, basi acutis, dentatis, in siccitate brunneis, supra parce hirsutis, subtus glandulosis, in costa dense stellato-pubescentibus hirsutis, in nervis hirsutis, nervis utrinque creiter 12: *cymis* axillaribus, brevibus, dichotomis, petiolos subaequantibus, *calyci* cupulato, extus parce hirsuto glanduloso, subtruncato, obscure 4-denticulato; *corolla* 3.5 ad 4 mm. longa, extus glandulosa: *staminibus* 4.

A shrub, the branches, branchlets, petioles, midrib, and inflorescences densely fulvous stellate-pubescent with intermixed simple hirsute hairs, the branches terete, the internodes 4 to 7 cm. long. Leaves dark-brown when dry, the lower surface paler than the upper, in general oblong-elliptic, subequally narrowed to the acute base and to the sharply acuminate apex, chartaceous, 12 to 14 cm. long, 5 to 6.5 cm. wide, margins sharply dentate, in the basal portions entire or nearly so, the upper surface densely hirsute on the midrib and with short scattered hairs on the surface, the midrib beneath stellate-pubescent and hirsute, the lateral nerves and primary reticulations sparingly hirsute with short hairs, the whole surface with pale, shining, small waxy glands; lateral nerves about 12 on each side of the midrib, prominent, curved, anastomosing, and with the reticulations dark brown in contrast to the paler surface; petioles 1 to 1.4 cm. long. Cymes axillary, shortly peduncled, dichotomous, about as long as the petioles, rather lax. Flowers 4-merous, white, their pedicels 1 to 1.5 mm. long, hirsute, jointed to the branchlets, the bracts linear-lanceolate, 1 to 3 mm. long. Calyx cup-shaped, subtruncate, obscurely 4-denticulate, about 1.4 mm. long, externally sparingly hirsute and with scattered shining glands. Corolla 3.5 to 4 mm. long, externally glandular, subequally 4-lobed, the lobes oblong, obtuse, about 1.5 mm. long. Stamens 4; anthers glandular on the back. Fruit depressed-globose, red when mature, about 3 mm. in diameter, sparingly glandular.

BRITISH NORTH BORNEO, Mount Kinabalu, Kibayo to Keuug, *Clemens 19846*, October 29, 1915, below an altitude of 1000 meters.

A characteristic species readily distinguishable by its brown leaves, its fulvous indumentum composed of stellate hairs with which are mixed simple hirsute ones, and its short, rather lax, inflorescences. It is similar in very many respects

to *Crematosiphonanthus* King and Gamble, but the pubescence on its leaves is less dense, while its flowers are smaller and with four, not five stamens, and it is not a true *Calanthe*.

***Hoseanthus*, nov. gen.**

(*Hosea* Reichenb., non DeCand.)

***Hoseanthus lobbii*, (C. B. Clarke) comb. nov.**

Chlorocallis lobbi (C. B. Clarke) Hook. et Th. Bot. Beech. 4 (1885): 799.

Hosea lobbi (Reichenb.) J. J. Sm. Brit. Bot. Soc. 50 (1908): 425.

SARAWAK: *Hosea* 137, *Farquhar* 88; *Nature collector* 280, 739 (Bur. Sci.).

The species was originally credited to Penang, localized from a specimen collected by Lobbs. There is not the slightest doubt but that Lobbs' specimen was from Sarawak, not from Penang. I have here proposed the new generic name *Hoseanthus* for this endemic monotypic Bornean genus, as the generic name proposed by Reichenb. is invalidated by *Hosea* DeCand.

***Sphenodesme*, J. J. Sm.**

***Sphenodesme borneensis*, sp. nov.**

Frutex scandens ramulis remoribus pubescentibus (sive dense ferrugineo-pubescentibus); foliis oblongis, coriaceis, usque ad 11 cm. longis, olivaceis, vix his, glaberrimis vel scabulis; costa nervisque leviter pubescentibus, basi notatis ad nerv. acuminatis, nervis nervic. 3, scabris, vix his, acuminatis, curvato-ascendingibus; ramis secundariis terminalibus, capitulis 5-floris, tenuiter adnatis, racemose dispositis, bracteis accrescentibus, ellipticis, usque ad 2 cm. longis, rotundatis, floris 5, mm. longis, prominenter ferrugineo-hirsutis, lobis bipartitis, corolla 5 mm. longa, glabra.

A scandent woody vine reaching a height of about 8 m. Branches and branchlets slender, terete, lenticellate, reddish-brown, the branches soon becoming quite glabrous, the younger branchlets densely ferruginous-pubescent with somewhat appressed hairs. Leaves opposite, oblong, coriaceous, shining, olivaceous when dry, of about the same color on both surfaces or the lower slightly paler than the upper, 8 to 11 cm. long, 2.5 to 5.5 cm. wide, base rounded, apex rather prominently acuminate, apiculate; lateral nerves 3 on each side of the midrib, the lower two pairs usually having the midrib in the lower two cm., very prominent, curved-ascending, anastomosing, the reticulations prominent, in young leaves sparingly pubescent on the lower surface, soon becoming quite glabrous; petioles 5 to 7 mm. long, when young pubescent, becoming

glabrous, not twisted. Inflorescence terminal, 10 to 15 cm. long, the heads arranged in a simple raceme, sometimes supplied with reduced leaves, all parts more or less ferruginous-pubescent. Heads 5-flowered, their peduncles slender, 1 to 2.5 cm. long. Bracts six, elliptic, rounded, often broadly apiculate, more or less pubescent, accrescent, rather coarsely reticulate, 7 to 20 mm. long, 5 to 10 mm. wide. Flowers greenish-white, 5 mm. long, the calyx prominently ferruginous-hirsute with spreading hairs, narrowly funnel-shaped, the lobes 1.5 to 2 mm. long, cleft to about the middle. Corolla as long as the calyx, glabrous, the lobes oblong, obtuse, about 2 mm. long. Style slightly exserted.

SARAWAK, *Nature collector 1847* (Bur. Sci.) (type): Santubong, *Forerouting 459*, June 7, 1908, on forested ridges in forests, altitude about 100 meters, locally known as *sumpin* (Malay).

A characteristic species, readily recognized by its few-nerved leaves, its 5-flowered heads, its elliptic, accrescent bracts, and its cleft calyx teeth. It is apparently most closely allied to *Sphenodesme barbata*, Schauer.

Faradaya, F. Mueller.

Faradaya matthewsii, sp. nov.

Frutex scandens, inflorescentius parce puberulis exceptis glaber: *foliis* chartaceis vel subcoriaceis, olivaceis, utrinque concoloribus, nitidis, ovatis vel oblongo-ovatis, usque ad 22 cm. longis, acumatis, integris, basi late rotundatis, subtus utrinque glandulis 2 vel 3 prominentibus disciformibus instructis, nervis utrinque 5 vel 6, prominentibus; inflorescentiis terminalibus: *floribus* albis, circiter 6.5 cm. longis, calvei juniore clauso, inflato, lanceolato, acuminate, 2 ad 2.5 cm. longo, extus glandulis paucis magnis disciformibus instructo; *filamentis* subaequalibus; *ovario* 1-loculare.

A scandent shrub, the stems about 2.5 cm. in diameter, glabrous except the sparingly puberulent inflorescence. Branches terete, smooth, glabrous, subolivaceous, about 5 mm. in diameter. Leaves opposite, chartaceous to subcoriaceous, ovate to oblong-ovate, up to 22 cm. long and 12 cm. wide, shining and olivaceous on both surfaces, entire, apex prominently acuminate, the acumens stout, blunt, base broadly rounded, rarely slightly cordate, the lower surface on each side of the midrib with two or three prominent, brownish, disk-like glands; lateral nerves 5 or 6 on each side of the midrib, prominent, curved, anastomosing, the reticulations lax, prominent; petioles 3.5 to 5 cm. long. Inflorescence terminal, cymose, about 15 cm. long, sometimes with a pair of greatly reduced leaves, somewhat puberulent, the bracts linear, filiform, about

5 mm. long, the bracteoles minute; pedicels up to 1 cm. in length. Flowers 4-merous, white, up to 6.5 cm. long. Calyx, in bud closed, lanceolate, rostrate-acuminate, 2 to 2.5 cm. long, inflated, externally very slightly puberulent and with few, large, scattered, brown, disc-like glands, in anthesis split nearly to the base into two lanceolate, valvate, acuminate lobes which are up to 8 mm. in width. Corolla-tube about 4 cm. long, 3 mm. in diameter below, somewhat widened in the upper 1 cm, the corolla narrowly infundibuliform, the lobes 4, imbricate, obovate, broadly rounded, narrowed below, up to 2.5 cm. wide, 1.5 to 2 cm. long. Stamens 4, equal or subequal, inserted about 2 cm. above the base of the tube, the filaments somewhat exerted, 3.5 cm. long, hirsute below, glabrous above; anthers oblong, versatile, 4 mm. long. Ovary ovoid, 3 mm. in diameter, somewhat cinereous-pubescent with short stiff hairs, 4-lobed, or when young 8-lobed, 1-celled with two parietal placentae, each placenta bearing two ovules; style glabrous, filiform, 6.5 cm. long; style arms 2, short.

BRITISH NORTH BORNEO, Sandakan, *Villmott* 253, in ravines at an altitude of about 12 meters, the flowers slightly fragrant.

This is the first representative of the genus to be found in the Sunda Islands, several species being known from New Guinea, one from north-eastern Australia, and several from Polynesia. The present species is dedicated to Mr. D. M. Matthews, Conservator of Forests, British North Borneo, and differs from the genus as described in its distinctly 1-celled ovaries, and in its equal or subequal, not didynamous stamens. It is, however, in all essential characters a typical *Faradaya*.

ACANTHACEAE.

Ruellia, Linnaeus.

***Ruellia tuberosa*, Linn. Sp. Pl. (1753) 635.**

Cuphoanthus barbadensis, Nees in DC. Prodr. **11** (1857) 197.

BRITISH NORTH BORNEO, Lahad Datu, *Forwerth* 619, March 25, 1916, a common roadside weed in the town of Lahad Datu, the blue flowers much in evidence along the roadside; it grows in hard clay soil.

A native of tropical America, introduced into Java as an ornamental plant, and now somewhat naturalized there, as it is at Lahad Datu.

RUBIACEAE.

Uncaria, Schreber.*Uncaria toppingii*, sp. nov.

Frutex scandens ramulis junioribus et foliis subtus in costa nervisque et pedunculis ferrugineo-hirsutus: *foliis* chartaceis, in siccitate brumeis, oblongis, usque ad 10 cm. longis, basi rotundatis, apice tenuiter caudato-acuminatis, nervis utrinque 7 vel 8; stipulis creiter 1 cm. longis, bilobatis, lobis oblongo-ovatis, acuminatis; *capitulis* longe tenuiterque pedunculatis bracteis magnis involuerantibus instructis; *floribus* sessilibus, ebracteolatis; *calyci* dense appresse ferrugineo-hirsuto, lobis linearilanceolatis tubum subaequantibus; *corolla* circiter 14 mm. longa, glabra; *capsulis* anguste ellipsoideis, circiter 1 cm. longis, quam pedicellis tenuibus brevioribus.

A scandent shrub attaining a height of about 3 m., the younger branchlets, lower surface of the leaves on the midrib and lateral nerves, and the long slender peduncles rather densely ferruginous hirsute with subappressed hairs. Branches and branchlets slender, dark-brown, terete. Leaves chartaceous, dark-brown when dry, 8 to 10 cm. long, 3.5 to 4.5 cm. wide, the upper surface glabrous except the somewhat hirsute midrib, base rounded, apex slenderly caudate-acuminate; lateral nerves 7 or 8 on each side of the midrib, prominent on the lower surface, curved-ascending, anastomosing, the reticulations subparallel; petioles pubescent, about 5 mm. long; stipules cleft, the lobes about 1 cm. long, oblong-ovate, acuminate, sparingly ferruginous-hirsute; hooks slender, recurved, stiff, about 1 cm. long. Heads solitary, axillary, in anthesis about 3.5 cm., in fruit about 5 cm. in diameter, their slender peduncles 6 to 8 cm. long, each head subtended by an involucre of 4 or 5 bracts, the bracts villous externally, 10 to 13 mm. long, oblong-ovate, acuminate, membranaceous, the margins below rather coarsely lobed, the basal portions united. Flowers numerous, greenish-white, ebracteolate, sessile or nearly so, the calyx-tube densely appressed ferruginous-hirsute, the lobes 5, linear-lanceolate, acuminate, 3 to 4 mm. long, about equaling the tube. Corolla-tube glabrous or nearly so, slender, 11 to 12 mm. long, the lobes elliptic-obovate, rounded, about 3 mm. long. Style exerted about 6 mm., the stigma narrowly obovoid-oblong. Capsules narrowly ellipsoid, narrowed at both ends, about 1 cm. long, their pedicels slender, equalling or slightly exceeding the capsule.

BRITISH NORTH BORNEO, Mount Kinabalu, Kiau, *Topping 1519*, November 1, 1916, on hillsides, altitude about 900 meters.

A species in the alliance with *Uncaria glabrata*, DC., well characterized, however, by its long and slender peduncles. It differs from de Candolle's species also in its more numerous nerves, and in many details of its flowers.

The Folk-tales of Indonesia and Indo-China.

BY R. O. WINSTEDT.

The area over which a folk-tale has spread proves nothing conclusively except the range of its popularity. But in view of Schmidt's synthesis of the Austroasiatic and Malayo-Polynesian families of language and of the evidence which Professor Kern has marshalled to show that Indo-China possibly was the region whence the Malay race descended on the Archipelago, it is interesting to note the occurrence of identical tales in the Indonesian and Mon-Khmer languages. For the folk-lore of Indo-China I have consulted Armonier's *Textes Khmèrs*, Landes' *Contes et Légendes Annamites*, Landes' *Contes Tjames* (Saigon 1887) and for Mon or Talaing tales *The Journal of the Burma Research Society*. For folk-tales of the Malay Archipelago, I have used an article on "Contes Javanais" by Dr. Hazeu in a fasciculus entitled *Hommage au Congrès des Orientalistes de Hanoi de la part du Bataviaasch Genootschap van Kunsten en Wetenschappen* (Batavia 1902). For folk-tales purely Malay I refer to my *Malay Literature, Part II* (1907) in the series of *Papers on Malay Subjects* published by the F. M. S. Government, to Skeat's *Fables and Folk-tales from an Eastern Forest* (Cambridge, 1901); and also to *Chèrita Jénaka* edited by myself and Mr. Sturrock and to the *Hikayat Pelandok* edited by Mr. Dussek, both of them printed in the *Malay Literature Series* (Singapore).

In No. 45 of this Journal I gave in English "Some Mouse-deer tales*"; on pp. 13 and 14 of *Malay Literature, Part II*, I have quoted from that paper the tale of how Mouse-deer cheated Tiger over Solomon's gong, which proved to be a wasp's nest, his viol which proved to be a slit bamboo, his saffron rice which proved to be dung, his turban (or belt, in some versions) which proved to be a coiled snake. The Malay version is given in Dussek's *Hikayat Pelandok*. There are also Davak and Javanese and Sundanese versions. It finds a close parallel in "Les Ruses du Lièvre" recorded (pp. 50-60) in Landes' *Contes Tjames*, and is found among the Cambodians (*vide* Armonier's *Textes Khmèrs*) and among the Annamites (*vide* Landes' *Contes et légendes Annamites*). I will give in outline the Cham version; it is significant that the "hare"—the Cham word is *tupai**—gores (*encorner*) the elephant with his horn (*de la corne*) (p. 59)!

* The story how Mouse-deer escaped from crocodile by pretending that his leg was a withered twig is very common in India where Jackal takes the place of Mouse-deer. Cp pp. 230-232, 384, F. A. Steel's "Tales of Punjab."

* Cf. Malay *tupai* "Squirrel."

One day the tiger, the hare, the otter, the hen, and the elephant went to cut straw to make a house. They left the tiger at their camp and he caught deer and cooked them rice and venison on their return. The next day the otter was left and he dived into the river and caught fish and cooked it for the other beasts. Then the hen took her turn and served up a dish of eggs. Finally it fell to the hare to cater. The hare was at a loss, so filled the rice-pot with dung (*croffes*), mixed it with stinking fish-paste (*muca manu*) and invited his companions to regale themselves. The hare pleaded a head-ache and no appetite! He yawned and cried *bay ih taputj, bay ih taputj*, a nonsense cry, suggesting *muutj ih tapay*, 'I smell *tapai*'s dung:—a cry which reveals to the beasts what they have eaten! Then they go and load their straw on the back of the elephant, and allow hare, as an invalid, to lie on it. He groans and asks the hen to hand him a fire-brand to keep his body warm. He blows it up and sets fire to the straw! And he shouts to the others to lead the elephant to windward. The otter extinguishes the flames by taking the elephant into the water. The hare, afraid of being killed by his companions, hides himself in the forest. He comes upon a snake who coils round him. The tiger discovers the hare and asks what he is doing. "I've donned a girdle of flowers, an heirloom of mine," says the hare. The tiger wants to put on the girdle. The hare demurs from dawn till noon. Then he bids the tiger get a thorn, and pierce the nose of the python. The python uncoils from the hare and coils round the tiger. Hare calls, "Come, men, and kill the tiger. The python has seized him." Men rush up with knives but the tiger bites the python and escapes. Tiger pursues hare and finds him beating a drum! The hare had stopped up the exit of a wasps' nest and was beating the nest and making the wasps buzz. Said the tiger, "What are you doing?" The hare replied, "I'm beating a drum left to me by my ancestors; it is a great solace, when I'm in the mood." The tiger asked to be allowed to beat it. The hare demurred; at last, he consented, adding, "If you wish to get a harmonious sound out of the drum, open the hole below and close that on top." The tiger follows this advice and beats the drum! Out swarm the wasps and sting him! The hare flees from the tiger and coming to a tree, whose branches rub together, climbs into it. The tiger enraged comes to the tree and bids the hare descend to be eaten. "Allow me till noon," pleads the hare, "to enjoy the strains of this *sharanai* (= Malay *sēranni*), an heirloom of mine." At noon the wind blew the branches together and made a noise. The tiger thought it was a musical instrument and begged leave to play it. "Eat me," said the hare, "for I can't allow it." The tiger persisted. "Well," said the hare, "wait till the wind blows and then apply your tongue to this interstice." The tiger did so, and his tongue was nipped! "Come men," cried the hare, "the tiger is caught in a tree." As the men came up, the tiger wrenched his tongue free, losing the tip of it, and vanished. In running away, the hare fell into a

dry pit. Up came the tiger and asked what he was doing. The hare answered, "Don't you know? To-morrow morning the sky is going to fall: I stay here to avoid being crushed." Said the tiger, "Pity me! Let me get into the pit with you." "I won't" said the hare. The tiger beseeched the hare from dawn till noon, when at last the hare consented. The hare told the tiger to cut a stick and give it to him. He prodded the tiger, "If you play the fool," said the tiger: "I'll make you jump up there, where the sky will crush you." The hare persists and is made to jump up out of the pit. "I'm off for a drink," says the hare, "and I'll return presently." The hare goes to a house where men are feasting and cries to them to go to the pit and kill the tiger. The men run to the pit. The hare enters the house, eats all the cakes and collects cups and bowls and hides them under a mat. He wraps a red kerchief round his head and beats a drum. The tiger roars and the men run home to see their cakes have disappeared. They think the hare is under the mat, beat it with sticks and smash their crockery! They see the hare on the roof, cannot reach him and set fire to the house. The hare leaps on to another roof and escapes. The hare sees the mistress of the house, where he had upset the feast, going to market to buy cakes bananas and sugar. He awaits her return, and pretends to be lying dead on the road. The woman picks him up and puts him in her basket, where he devours her purchases and skips away, when she opens the lid. The hare meets the elephant, who is weeping. "Why do you weep?" asked he. "I and the tiger agreed to roar," said the elephant: "if I trumpeted so as to terrify all the beasts and birds of the forest, I was to eat the tiger: if he roared so as to terrify them, he was to eat me. He won and is going to eat me to-morrow morning." The hare replied, "Let me save you. Get me betel and to-morrow morning, when I run under you and strike you with my horns, pretend to fall down dead and roll over as I butt you." The elephant did so: the hare butted him as he rolled and spat the blood-red betel juice over his body. The tiger saw it and thought the hare had gored the elephant, and he was afraid and fled away. The tiger met a tortoise and told him of what had happened. The tortoise said "Tie me to you with a rattan and I'll take you to kill the hare." The tiger did so: they met the hare and the tiger fled, knocking the tortoise insensible against a tree stump. Presently the tortoise revived. He was bleeding and he said to the tiger, "Lick this betel juice off me." The tiger licked, thinking it was blood?

For the story of the hare stumbling into a pit and crying out that he was there to avoid the falling sky, there are parallels in my tales recorded in *Journal* No. 45, and in Klunkert's *Hikayat Pelandok Djinka* (Leiden 1885)—which is reprinted in Dussek's *Hikayat Pelandok*. And there is a parallel for the Cham story of the hare saving the elephant from the tiger in Skeat's *Fables and Folk-tales*. Skeat's story relates how elephant and tiger wagered to make monkey fall from a tree: whoever succeeded was to be

eaten by the other. Tiger succeeded, but when he wanted to claim the booty, mouse-deer poured molasses down the elephant's back, told him to trumpet as if in pain and standing on his back made believe to gnaw him. The tiger fled in terror, till the ape told him it was only a mouse-deer; but the mouse-deer made tiger flee once more by crying "Why did not you bring two tigers, ape, for my meal instead of one?" Both in the collection and in Kluckert's *Hindout* hotel place is used by the mouse-deer to simulate blood.

Another Malay mouse-deer tale finds its parallel in Mon (or Talaing) folk-lore, where, according to the translator a "squirrel" takes the place of the mouse-deer. Siam calls the Malay tale, "The tiger gets his deserts." There is the same tale, with the variation that a taller tree takes the place of the trap and outwits the place of the man and crocodile the place of tiger, in my tabs in *Journal* No. 45 and in Dasse's "Hexavat Katalil" in the book *Higant Pelanduk*. The Mon tale has even the same literary device as the Malay story wherein a road, a tree, a sleeping-mat and a dish-cover are severally consulted on the question of altruism—*ibid.* p. 12 *Malay Literature, Part II* and p. 2 *Hexavat Pelanduk*. The Mon tale has been recorded by Stewart in p. 49, Vol. IV, Part I (April 1914) of the *Journal of the Bernice Research Society*:—

"Long ago, a man went to the forest and found a tiger caught in a trap. 'Set me free,' the tiger called to him, 'O lord of benefits.'

'If I set you free, am I safe from you? Will you eat me?'

'I will not eat you. Do but set me free.' So the man went and released the tiger and the tiger said, 'I've long been without food and now I am going to eat you.'

'It is not fit that you should eat the man who set you free. But let us go and hear the judgment of the Dewatas of the tree in the middle of the clearing. . . . O Dewatas, I set the tiger free. Is it fit or not that he should eat me?'

And the Dewatas of the tree replied, 'Lo, men come and go and rest under my shade. My branches they break and sit upon them. Therefore,' said the Dewatas of the tree, 'it is fit that the tiger eat thee.'

Then the tiger said, 'Now I am going to eat you.' But the man said, 'Nay, we will go to the Dewatas of the Bridge. . . . 'Oh Dewatas, the tiger was caught in a trap and I set him free. Is it fit or not that he should eat me?' And the Dewatas of the Bridge replied, 'Lo, men cross over upon me and some use me for unworthy purposes. Therefore,' said the Dewatas of the Bridge, 'it is fit that the tiger eat thee.'

'Now,' said the tiger, 'I am going to eat you.' 'Wait yet a little,' said the man. 'When you have the third judgment in your favour, eat me.' So they went and came to a squirrel, and the

squirrel when he saw the man fled. The man followed, shouting, "Wait, be our instructor and decide our case." Hearing this, the squirrel stopped and said, "Don't you come near; speak to me from a distance." Then the man told the circumstances of the case and the squirrel said, "I myself did not see these things happen. I cannot decide. Show me the place where the tiger was caught. Let us go and see. But how shall we go? I do not trust you two. Let the tiger go first, the man next and I will follow." When they came to the trap, the squirrel asked, "How was the tiger placed. Show me, tiger-beast—get into the trap—how you were bound, how you were released. Have you tied him fast? Now tiger can you move?" "Hardly at all," said the tiger. "Oh man, is he tied fast?" "As fast as can be" said the man. "Tiger" said the squirrel, "you have no conscience. Let the man go as he came. I will go as I came. Let the tiger remain in the trap. Thus I give judgment?"

This is a very common Indian story. It is told in the *Gul Bakawali*. It may be found also in F. A. Steel's *Tales of the Punjab* (pp. 107, 307, 336) where a *pīpal* tree, a buffalo yoked to an oil-press and the road are asked about altruism. And it occurs in Thibet.

There is a set of Malay 'clock' sayings:—

Baqau, baqau ' kēnapa kau-kurus?
Baqai-mama aku ta' kurus ' Ika ta' timbul.
Ikan, ikan ' Kēnapa ta' timbul?
Baqai-mama aku 'nak timbul?
Rumput tērlalu panjang.
Rumput, rumput ' Kēnapa kau-panjang?
Baqai-mama aku ta' panjang ' Kēbau ta' makan aku.
Kēbau, kēbau ' Makan rumput.
Baqai-mama aku nak makan?
Pērut tērlampau sakit.
Pērut, pērut! Kēnapa kau-sakit?
Baqai-mama aku ta' sakit? Makan nasi mēntah.
Nasi, nasi! Kēnapa kau-mēntah?
Kayu habis basah.
Kayu, kayu. Kēnapa kau-basah?
Baqai-mama aku ta' basah? Hujan mēnēnupa aku.
Hujan, hujan ' Kēnapa kau-timpa kayu?
Baqai-mama aku ta' timpa? Katak mēmanqgil aku.
Katak, katak ' Kēnapa kau-panqgil hujan?
Baqai-mama aku ta' panqgil? Ular 'nak makan aku.

Ular, ular! Kĕnapa makan katak?

Bagu-mana aku ta' makan?

Sudah Mewang makan-makan kani.

Cantos Tijmes No. XVII gives a "Chanson d'Enfants," of which the first couplet is almost identical:—

"Aigrette! aigrette! Pourquoi es-tu maigre?—Si je suis maigre, c'est que les crevettes ne montent pas. Crevette! crevette! Pourquoi ne montes-tu pas? Si je ne monte pas, c'est que les herbes me retiennent. Herbe! herbe! Pourquoi foisonnes-tu? Si je foisonne, c'est que le buffle ne me mange pas. Buffle! buffle! Pourquoi ne manges-tu pas? Si je ne mange pas, c'est que le piquet ne se défait pas. Piquet! piquet! pourquoi ne te défais-tu pas? Si je ne me défais pas, c'est que bék ne garde pas. Bék! bék! Pourquoi ne gardes-tu pas? Si je ne garde pas, c'est que j'ai le ventre gonflé. Ventre! ventre! Pourquoi est-tu gonflé? Si je suis gonflé c'est par le riz cru. Riz! riz! Pourquoi es-tu cru? Si je suis cru c'est que le bois est mouillé. Bois! bois! Pourquoi es-tu mouillé? Si je suis mouillé, c'est que la pluie est continue. Pluie! pluie! Pourquoi es-tu continue? Si je suis continue, c'est que la grenouille se gratte le derrière. Grenouille! grenouille! Pourquoi te grattes-tu? Si je me gratte c'est que nos aieules se sont grattées. Comment pourrais-je ne pas me gratter?" There is a parallel in Talaiing (or Mon):—vide p. 68, Vol. IV Part I *Journal of the Burma Research Society* (Rangoon 1914).

Tree, tree why are you crooked?

The heron perched on me.

Heron, heron why did you perch?

To watch a fish.

Fish, fish why did you rise?

Because the buffalo waded.

Buffalo, buffalo, why did you wade?

Because the herd beat me.

Herd, herd, why did you beat?

Because I was hungry for rice.

Rice, rice why weren't you boiling?

Because the fire didn't blaze.

Fire, fire why didn't you blaze?

Because the firewood was damp.

Firewood, firewood, why were you damp?

Because the rain rained.

Rain, rain why did you rain?

Because the frog called.

Frog, frog, why did you call?

Because I was thirsty.

Little blackguard frog, in the well under the

banvan tree is there not enough to drink?

But Lal Behari Day, tells us in his 'Folk-Tales of Bengal' (Macmillan 1883) that every orthodox Bengali story ends with a very similar set of lines as a formula.

In *Malay Literature*, Part II, pp. 20-22, 63-67, I pointed out how very like the Malay tale of "Si Lunchai" is to the Burmese story of "Saw Kay." Has this Burmese tale perhaps a Mon origin?

On p. 62 of the same pamphlet or in *Chërîta Jênaka* will be found an outline of the Malay story of Pa Bêlalang:—*Chërîta Jênaka* gives the tale at length in Malay. A. F. von Dewall also has printed "Tjêritêra Pak Bêlalang" in his *Bunga Rampai*, Part IV (Batavia, 1902). The tale occurs in Central Celebes, among the Bataks and in Macassar—*vide* pp. 377-379 of a paper by Dr. Adriani on the literature of the Toradja (*Tijdschrift, Bat. Gen.* XI, deel 4). Among the Sundaese, the hero bears the name of Aki Bolong (cf. Grashuis' *Soendaneesch Leesboek*): among the Javanese the name of Pak Bandjir—in 1873 R. E. Bastiaan printed a metrical version of "Pak Bandjir" (Semarang, von Dorp). And Dr. Hazen mentions a tale known in Batavia and called "Djankar-Djangkrik" which is a variant of "Pak Bandjir." Now Niemann has pointed out (*Bijdragen. Koninklijk Instituut* 6 I p. 348) how the Khmer story of Thmênh Chey (Aymonier, *Textes Khmêrs*, pp. 20-30) has many points of resemblance with the Indonesian story. For instance, Thmênh Chey is ordered by a prince of Cambodia to solve a riddle propounded by the emperor of China, namely as to the number of seeds in a Chinese water-melon: and by a lucky accident, such as saved Pa Belalang on a similar occasion, Thmênh Chey solves it.

Dr. Hazen gives a Batavian story of "Si Kêbavan," which bears resemblance to the adventures of A. Lev, recorded on p. 3, sqq. of Aymonier's *Textes Khmêrs*. A man called Pak Bali wants to marry his daughter to some one with a "sharp nose" (*hidong tajam*). Kêbavan secretes sugar coffee and sweets in Pak Bali's house and wins the daughter by pretending to nose them! Kêbavan goes with his father-in-law to cut bamboo, but tiring of the work exclaims, "I smell a tiger," which puts an end to the day's toil. Kêbavan and his father-in-law go to the tomb of the latter's wife to pray but growing tired Kêbavan exclaims, "I smell the devil," which puts an end to their devotions.

There are the Javanese tales of Watu-Gunong and Nawang-Wulan, which occur moreover among many of the peoples of the Malay Archipelago—see p. 379 of Adriani's paper cited above. Parallels to these tales are to be found in *Contes et légendes Annamites* (LIII and LIV), in Landes' *Excursions and Reconnaissances* X p. 43. And the story of "Le Fort," VIII in Landes' *Contes Tjames* (Saigon 1887) bears a likeness to the tale of "Todjo."

Landes' *Contes Tjames. (Excursions et Reconnaissances XIII)* gives a story called "Noix de Coco" which finds parallels

in the Javanese tales of Djaka Debeg, Djaka Schra, Kadal Kentjana, or Djaka kendil (published by Poensen, *Ontjeu-Ontjeu III*; Batavia, Landsdrukkerij) and the Madurese tale *Tjaret Brakai* (ed. Vreede, Leijde 1887)—*vide* p. 370 of Adnani's paper.

The points of resemblance between the folk-tales of Indonesia and the folk-tales of Indo-China are so numerous and so close that one may venture to doubt if they are due merely to fortuitous borrowing.

Speech
at the
Ceremonial Haircutting of a young child.

EDITED
BY O. T. DUSSEK.

The following speech is in vogue in the Kuala Pilah District and was dictated to me by Enche' Kasah bin Md. Ali, Batu Kikir.

I am indebted to Mr. R. O. Winstedt for valuable assistance in preparing this paper.

ĒNDUL.**Uchapan mēchukur budak kēchil.**

- (1) Bi-'smillāhi 'r-rahman 'r-rahim.
La ilāha il-lālah. Muḥamad a'r-rasulū'llah.
- (2) Bi-'smillāh itu pērmulaan nama.
Kēadaan dzat-nya bērsama-sama:
Dzahirkan sifāt mēnyatakan isma.
Kadim dan tāt sēha lama.
- (3) Hai sēgala anak-nya Adam.
Asal-nya walu umū'l khatam.
Di-pēchah-nya ēmpat nasir-nya Adam.
Di-pēchah-nya pula sakalian alam.
- (4) Rahim bapa-mu turun ka-ibu-mu.
Ēmpat-puluh hari nutfah nama-mu.
Dēlapan-puluh hari alkah nama-mu.
Sa-ratus dua-puluh hari alamah nama-mu.
- (5) Di-kandung ibu-mu sēmbilan bulan.
Lēbih atau kurang tiada di-tēntukan:
Bēranakkau dikau bērapa kēsakit.
Bērapa-lah paptang minum dan makan.
- (6) Chukup sēmbilan bulan bilangan-nya
Dzahir-lah ēngkau ka-dalam dunia:
Baharu-lah suka bapa ibu-nya.
Ka-pada ēngkau banyak kasah-nya.
- (7) Harap ibu-mu bukan sakkit.
Tinggi-lah harap dari pada bukit:
Lama ibu-mu mērasai sakit.
Sēmbilan bulan tiada bērbangkut.
- (8) Kēnangkan oleh-mu sakalian anak.
Tētōkala ēngkau lagi kanak-kanak:
Ava bila sudah tidur-mu cuak.
Di-charikan makan manis dan lēmak.
- (9) Hai anak-ku, jangan kau bantah
Pēliharaan ibu-mu saugat-lah susah:
Di-aleh ka-kiri kauan pun basah.
Tiada-lah ēngkau mēnaroh insaf.
- (10) Satēlah kaum sudah-lah ada.
Siang dan malam ibu-mu jaga.
Tidur pun tidak barang sa-kētika.
Makan dan minum tidak bērasa.
- (11) Bērapa-lah dian dēngan-nya tanglong.
Di-augkat di-tuam lalu di-bēdong:
Sudah-lah jaga lalu di-dokong.
Kasah dan savang tiada bērtanggong.

TRANSLATION

- (1) In the name of God, the merciful, the compassionate.
There is no God but God: Mohamad is his Prophet.
- (2) In the name of God, the first of all Names,
And He and His Name co-existed in the beginning.
Reveal His attributes and declare His Names,
For He is eternal and we His servants from old.
- (3) Oh, all ye descendants of Adam,
Sprung from the eternal light of God,
Adam sprang from the four elements:
And thus is descended all creation.
- (4) O child, the grace of thy father visited thy mother
And after 40 days thy seed was created.
After 80 days thy blood was made,
After 120 days thy flesh was fashioned.
- (5) Nine months in the womb since thy mother conceived,
Roughly but not exactly that period:
With what pain and suffering wast thou born:
What privations she endured.
- (6) When nine moons had waxed and waned
Thou came'st into the world:
Then how delighted thy father and mother.
How strong their love for thee.
- (7) High are the hopes thy mother builds,
Yea, higher than the hills:
How long she suffered for thee,
Nine long months confined to her couch.
- (8) O all ye children, return your mothers' love,
While still ye are young:
Whilst ye slumbered pleasantly
They sought ye sweetmeats and dainties.
- (9) And thou, O child, reject not
Thy mother's watchful care,
If she turned thee to the left the right thou defiled'st:
Yet thou knewest not of these things.
- (10) When thou wast born,
Unceasing was thy mother's care:
Not a moment did she spare for sleep,
For food she took no thought.
- (11) By light of candle and lantern,
How often she poulticed thee and wrapped thee in thy baby
garments.
She dandled thee when awake:
Such love and care is not easy to requite.

- (12) Tiada-lah tentu siang dan malam
Bangun mēmaraku di-dalam kelam:
Tērajujut jaga di-tēngah malam,
Tular pun tidak dapat di-tulam.
- (13) Kēuangkan ayah-mu anak bangsawan,
Pēliharakan dikau sangat kēsusahan,
Di-pēlihara danti pada angin dan hujan,
Takut tēksēma pēvakit sawan.
- (14) Jika ibu-mu ada hamba di-suroh,
Nyamok pun tidak hambar ka-tuboh,
Tirai kēlambu di-bēntang, di-buiboh,
Lalin dan tangloze di-pasang, di-suloh.
- (15) Walau pun ibu-mu ada bērhutang,
Kau sa-hēlai juga di-pinggang,
Basah di-ampai kering di-pinggang,
Di-dokong, di-galas tiada bērēnggang.
- (16) Kēuangkan ayah-mu anak bangsawan,
Barang kata-nya jangan di-lawan,
Ibu bapa-mu pērhubongan Tuhan,
Baharu-lah sēmpurna anak bangsawan.
- (17) Jika ibu-mu orang-nya kaya,
Di-suroh pēlihara hamba dan sahaya,
Sērtā di-kampongkau dunt bēlanja:
Itu pun ēngkan kurang bērhaya.
- (18) Apa bila ēngkau dapat mēmbulang,
Di-suroh mēngaji pagi dan pētang,
Rumah guru-mu tēmpat bērulang,
Pagi dan pētang tiada bērselang.
- (19) Apa-bila ēngkau dapat mēngaji,
Ibu-bapa-mu suka-lah hati,
Di-chari-nya ringgit sehari-hari
Hēndak di-surohkan ēngkan ka-haji.
- (20) Pērgi ka-haji tanah yang suchi,
Hēndak mēmbuang nama yang kōji,
Shakh itu suroh mēngaji,
Bacha Koran, jangan ēngkan bēnchi.

- (12) Night and day at times all uncertain,
Ere daylight she rose and dandled thee,
Up to watch thee in dark of night
Nor once could pillow her weary head.
- (13) Love too thy father, child of birth so gentle,
Who cared for thee through every travail;
Protected thee from wind and rain,
Lest convulsions should attack thee.
- (14) If thy mother has servants at hand,
Then no insects can harm thee,
Thy bed-curtains are ever closed,
Candles and lanterns always alight.
- (15) And if thy mother is in debt,
With but one garment to her back,
And this when wet must dry as she wears it,
Yet ever does she care for thee and never leaves thy side.
- (16) Love thou thy father, gentle child,
Take care not to disregard his word;
When father and mother are united by God,
Then is thine a perfect lot.
- (17) If thy mother is of rich parentage,
Her slaves and servants all attend thee,
And she saves for thee her utmost farthing,
Though thou can'st not understand this.
- (18) And when thou can'st count,
Thou must to school morning and noon,
With thy teacher to study the Koran,
Morning and evening without interruption.
- (19) And when thou canst read the Holy Book,
How glad will be thy parents;
E'en now they save a share of their earnings,
To send thee on the pilgrimage.
- (20) Thou wilt go to the Blessed Land,
To cleanse all that is unclean;
The Shaikh will order thee to read the Book,
Take care never to neglect it.

Gordonia.

BY I. H. BURKILL.

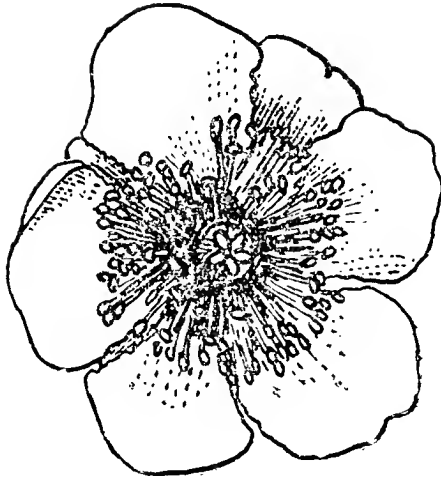


Fig. 1. The flower of *Gordonia singaporiana*, Wall., viewed horizontally.
and enlarged by one third.

An enquiry upon a *Gordonia* undertaken for the Forest Department, led into such confused literature, that I have thought it well to draw together the following notes upon the genus in the hope that by publishing them, I may leave it a little more open to investigation. However but for Mr. Ridley's correction of some of the nomenclature in the *Journal* for 1916, I could not have done even this.

The genus is one of the Ternstroemiaceae, and the relationship to *Camellia* and *Thea* is fairly well suggested by the figure above.

THE FOUNDING OF GORDONIA ON AN AMERICAN PLANT.

The first *Gordonia* to become known was the American Loblolly Bay. In the eighteenth century it was a fast-growing tree shrub in the gardens of the curious in Natural History in Western Europe, as, from its home on the Atlantic seaboard from Maryland southwards to the mouth of the Mississippi, its seeds had been easy to procure, and the plant which attains the size of a tree in its own home, was here to flower in pot-herbs as a curiosity. Linnæus, as early as 1742, named it *Hesperisæ Lasiotatus* when writing his catalogue of Clifford's garden, and repeated this name in his *Species plantarum*. Then John Ellis, a London merchant, who interested himself especially in what ships could bring him from the New World, made the examination of a plant which flowered at Charleston, cut it apart from the genus *Hesperisæ* and named it *Gordonia* (1779) after a well-known emigrant, James Gordon then living in London.

From another plant cultivated at Wandsworth, on the outskirts of London, John Sims in 1802 figured flowers and foliage on plate 668 of the *Botanical Magazine*.

Linnæus accepted the name *Gordonia* from the first and used it in his *Manihisæ plantarum altera*, 1771, p. 579.

Into the genus *Gordonia* so established, another American plant was soon placed,—*G. ochroleuca*, (L'Heritier, *Silvæ americ.*, 1784, p. 156), a tree found like *G. Lasiotatus* on the Atlantic seaboard of the United States.

GORDONIA FOUND IN ASIA, BUT CALLED CAMELLIA.

On American soil, *Gordonia* has proved to be confined to these two species, the second of which is now reported extinct in a wild state. But above a score of species have been found in Asia.

At first there was some confusion among the European botanists in the East as to what should be called *Gordonia*, so that we meet with *G. oblata* and *G. integrifolia* in Roxburgh's works, and *G. Chiamura* in Buchanan-Hamilton's, applied to what is now regarded as *Schinus* and there occurs a *G. spectabilis* in the manuscript of William Hunter, of 1803 (printed in *Journal* No. 54, 1909, p. 104) which is doubtless also a *Schinus*. At the same period, but on the other hand, a true *Gordonia* of Chinese origin found its way into the genus *Camellia*. This last is the *G. arillaris* of Hongkong,—the first recorded plant of which was brought to the London nursery of Messrs. Whitley, Brames and Milne. In December, 1818, it flowered for the first time, and both the then-existing rival illustrated London botanical journals,—the *Botanical Magazine* and the *Botanical Register*,—obtained a drawing and both published under the date of February 1st, 1819. So similar are these two plates which we know came from the same plant, that

they appear to have been drawn from the same branch, and not only from the same branch, but from the same branch with the same flower open. But in the letter press there are differences which must be referred to, the most important of which is that, under plate 349 of the *Botanical Register*, Ker, editing for Sydenham Edwards, wrote that the possessors of the plant had got it some years before from the late Dr. Roxburgh, the Superintendent of the Honourable East India Company's garden at Calcutta, and that Roxburgh had got it from Penang; whereas in the *Botanical Magazine* under plate 2047, Sims wrote that it was thought to be one of some Camellias received a few years previously from a Mr. Roberts from China.

While thus diverging both writers used the name *Camellia axillaris* referring to a manuscript left by Roxburgh, which the one called a Flora of India and the other merely a manuscript in the possession of Sir Joseph Banks. It is evident from the *Botanical Register* that Robert Brown, then librarian to Sir Joseph Banks, had been consulted; and it is therefore hardly possible to avoid the conclusion that Brown had identified the plant, but we do not know from what, as the published *Flora indica* of Roxburgh does not contain *Camellia axillaris*.

ROXBURGH'S CONNECTION WITH THIS PLANT IS VERY DOUBTFUL.

It is well known that before Roxburgh's death in 1815 he had furnished to various scientists copies of his Flora, keeping one in his own possession when he sailed from India, with the intention of revising it for publication, and that seventeen years after the father's death his two sons, Captains Bruce and James Roxburgh, caused the part dealing with the Higher Plants to be printed at Serampore in India, it is said "exactly as he had left it." Are we to assume that Banks had in 1819 a copy with late notes which escaped publication in 1832? It appears so: for, though Sir William Thiselton-Dyer records (*Journal of the Linnean Society of London*, XIII, 1873, p. 330) that he had searched in vain for the diagnosis of *Camellia axillaris*, (i) Brown would be unlikely to misquote, (ii) the two rivals would be unlikely both to misrepresent him, and (iii) the form of the brief diagnosis is just such as Roxburgh used. It was rendered from English into latin in both works with the term villous for describing the calyx in the *Botanical Register* but the term silky in its place in the *Botanical Magazine*.

So far then we may accept it that Roxburgh appears to have handled a plant from Penang which he called *Camellia axillaris*; but that does not prove it to be the Chinese plant which was described under this name in 1819; and, indeed, it is more likely that Ker invented the connection of the individual in Whitley, Brames and Milne's nursery with Roxburgh as a sequel to Brown's identification than that Sims is wrong in saying that a Mr. Roberts sent it from China. In any case the species does not grow in Penang, and though it could have reached Roxburgh via Penang from the

China coast the diagnosis as quoted is so very meagre, that it might easily apply to another plant of the same order such as occurs in Penang.

There is among the dried plants described by Wallich in 1832, a specimen labelled *Camellia avillaris* which is not the *Camellia avillaris* of (? Brown ex Sims and Kew, and as the diagnosis does not fit it, it is probably some substitute. But it is said that the handwriting is Roxburgh's, and there must be considerable proof that Roxburgh used the name for some other Chinese species.

THIS ASIATIC GORDONIA PERSISTS IN CULTIVATION.

Probably from 1819 forward this Chinese plant so introduced by Wintley, Brames and Michel, was not lost to European gardens: it finds mention in several publications of the immediately following years, the first of which was Robert Sweet's *Hortus Britannicus*, 1826, when in the genus *Polyspora* was put forward for it and it became *Polyspora avillaris*. In 1842 it was at Kew, having been received from Liege, and flowered, figures in plate 1019 of the *Botanical Magazine* under which Sir William Hooker confidently stated it to be Chinese because he had got dried specimens from China. Quite recently (*Gardener's Chronicle*, Vol. 9, 250, June 23rd, 1917) it has been figured again from Kew.

There are certain differences between Hooker's plate and the two which went before it, which may be touched upon next.

IT APPEARS TO EXHIBIT GYNODIOECISM BUT THIS WAS NOT SUSPECTED.

It had not escaped the wonderful acumen of Robert Brown that there was something sexually imperfect in the flower of the plant which he saw in 1818: it appeared female; but the flowers of the plant which flowered in Kew in 1842 were apparently fully hermaphrodite. This evidence of the occurrence of gynodioecism in the species is now supported by the discovery of similar sexual variations in allied plants. But apparently Choisy who monographed the order in 1855 did not appreciate it, so that (*Mémoires de la Société physique de Genève*, xiv, p. 144) he thought it necessary to make two species,—*G. avillaris* and *G. Lessertii*, of the two, and in doing this he appears also to have made some further confusion.

GORDONIA RECOGNISED AS AN ASIATIC GENUS, THE SEQUENCE IN WHICH SPECIES WERE DEDUCTED.

Returning to the year 1826 when Sweet tried to establish the genus *Polyspora* for *Camellia avillaris*, not putting it into *Gordonia* perhaps because there were in *Gordonia* the misplaced plants named on p. 144, we come to the announcement by the Dutch botanist Blume of the occurrence of *Gordonia erecta* in Java, being the first

placing of a true Asiatic *Gordonia* correctly. But it was not long before Wallich also recognised the genus; and species were added to species in the following order:—

- 1826. *G. excelsa*, Blume, a plant which occurs sparsely in the mountain forests of both east and west Java, between 1,500 and 7,000 feet.
- 1832. *G. obtusa*, Wallich¹, South-western India from the Konkan southwards in mountains between 2,000 and 7,000 feet, plentiful in the Nilgiri Hills.
- 1832. *G. singaporiensis*, Wallich¹, in Singapore at low levels and also in Malacca; in Penang about the hill tops. It is the *G. grandis*, of King, but not of André.
- 1840. *G. zeylanica*, Wight, Ceylon in the forests from 4,000 to 7,000 feet.
- 1846. *G. elliptica*, Gardner, Ceylon in the forests of the Central Province, but doubtfully distinct from the last.
- 1855. *G. speciosa*, Choisy, Ceylon, very local in the higher mountains.
- 1860. *G. brevifolia*, Hooker fil., Borneo on the Mountain of Kinalu at 8,000 feet.
- 1860. *G. Lobbi*, Hooker fil., Borneo in Sarawak.
- 1874. *G. Muirgigi*, Dyer, Perak and Malacca, on the lower slopes of mountains.
- 1876. *G. dipterosperma* Kurz, Sikkim Himalaya and Khasia hills. It has been reduced to *G. excelsa*, Blume, in several works.
- 1880. *G. grandis*, André, a garden plant, imperfectly known.
- 1886. *G. luzonica*, Vidal, Luzon, common in the higher mountains. It was redescribed in 1906 as *G. fragrans*, Merrill.²
- 1890. *G. Scurtchinii*, King, Perak.
- 1890. *G. imbricata*, King, Perak and Pahang, in the mountains.
- 1890. *G. multiflora*, King, Perak and Singapore.
- 1906. *G. sinensis*, Hemsley and E. H. Wilson, S.-W. China on Mount Omi.
- 1908. *G. Walburnii*, Ehaer, Southern Philippine islands in mountains.
- 1910. *G. Balansac*, Pitard, Tonkin on the Mountain of Ravi near Sougi.
- 1910. *G. tonkinensis* Pitard, Tonkin, in the neighbourhood of Ninh-binh.

¹ Wallich's lithographed catalogue of the plants in the East India Company's herbarium has been ruled to be no publication; but these names, are valid nevertheless, though not from 1832.

² Mr. Merrill himself reduces this.

G. acuminata Vidal (*G. Vulain*, Szyszylowicz) described from Luzon in 1886 is shown by Mr. E. D. Merrill not to be a *Gordonia* at all.

1916. *G. penanensis*, Ridley, Penang and Singapore. It was misnamed *G. excelsa* by King in 1890.

1916. *G. hirtella*, Ridley, mountains of the Malay Peninsula from Perak to Negeri Sembilan.

To these 24 species I have four to add, being *G. taipingensis* from the hills near Taiping, *G. concentricatri* from Selangor, *G. Handianho* from Sarawak and *G. lanceifolia* also from Sarawak, making 28 in all; but as I consider the Asiatic species of *Hacnorcharis* to be *Gordonias*, the genus is really in my view of well over 30 species; but all of them want more study.

ATTEMPT TO DIVIDE GORDONIA IN CONFORMITY WITH ITS DISCONTINUOUS DISTRIBUTION.

Szyszyłowicz (on Engler's *Pflanzenfamilien*, iii, part 6, 1893 p. 185) divided the genus *Gordonia* into two sections, the American species forming the first, and the Asiatic species the second. He gave no sectional names, and did not define the two. Korthals and Pitard have separately gone further in attempts to cut the Asiatic species from the American. Korthals' attempt was made long ago (*Verhandl. over de Natuurlijke Geschiedenis der Nederland overzeesche Bezittingen, Kruidkundig*, 1839-1842). He made two new genera to hold the Malayan species regardless of the existence of *Polyspora*; and on p. 127 he wrote "The plants on which the genera *Anthreischima* and *Clasaschima* (his new genera) have been established, were formerly written up and described under the genus *Gordonia*, but a closer comparison with material of the American types, leads me to observe that this union of Indian and American plants can be severed, and leads me on into presenting two new genera for the former, cut out of *Gordonia*." This shows him dominated by the idea that plants from opposite hemispheres should not be in the same genus. And he continues defining the first genus *Anthreischima* upon doubtful interpretations of its bracts and calyx adding the last sepal (which is seen in fig. 1, to the top and right) to the petals and another sepal to the bracts so as to reduce the number to 3; and on "the stamens being free in *Gordonia* or united into five bundles; but in *Anthreischima* grown together with the petals into a ring." He next admits this genus as rather indistinctly defined but "*Clasaschima* differs by reason of its more shrubby growth, lesser development of leaves, and flowers and in some floral characters; it has five or apparently by the enlargement of a bract six sepals, five petals spirally arranged and five stigmas almost without styles."

The last character is that of *Hacnorcharis* into which his genus has been placed in later years, while the single species making the genus *Anthreischima* has been returned to *Gordonia* as Blume's *G. excelsa*. Yet Korthals continues under *Clasaschima* to describe the *C. marginata* as having a style.

Pitard has taken a roughly parallel line. In the *Actes de la Société Linnéenne de Bordeaux*, 1902, Comptes rendus, p. 54, he tries to establish the genus *Nabiasodendron* for the Asiatic Gordoniae, at the same time separating the two American species from each other generically. Like Korthals he points to the arrangement of the stamens: but then Korthals did not know the *Gordonia speciosa* of Ceylon which has its stamens in five distinct bundles like *G. Lasianthus*, and Pitard does: so Pitard does not find the character absolute and turns to the capsule for a supplementary one, and after it to anatomical characters.

DISCONTINUOUS DISTRIBUTION IS BY NO MEANS UNUSUAL IN GENERA ALLIED TO GORDONIA. THEIR DEMAND FOR MOISTURE RULES THEIR DISPERSION.

Like Korthals, Pitard seems to have been dominated by an idea that the discontinuous distribution requires that we should find generic characters between those plants which occur in eastern America, and those which occur in eastern Asia. It is a wrong presumption because there are several allied genera equally astride the Pacific, among those comprising the Thecae and Ternstroemieae as the reader will observe if all the genera be enumerated:—
Bonnellia, coasts of tropical S. America.

Archipflaea, coasts of the Pacific from S. America to Penang.

Asteropsea, Madagascar.

Thea (including *Camellia*), from Assam to Japan and to Java.

Gordonia (i) eastern coasts of N. America.

(ii) forests of the Himalaya and S. China to Java chiefly on mountains.

Haemocharis (i) W. Indies and tropical S. America.

(ii) Borneo, Java, Sumatra and Moluccas.

Schinus, as *Gordonia* (ii).

Hartia, S.-W. China.

Pyrenaria, as *Gordonia* (ii).

Stewartia (*Stuartia*), (i) Mountains of eastern N. America.

(ii) Japan.

Ternstroemia, (i) S. America.

(ii) as *Gordonia* (ii).

Palasocya, north-west S. America at 10,000 feet.

Anneslea, Himalaya to the Philippine Islands.

Adinandra, (i) as *Gordonia* (ii).

(ii) Island of St. Thomé on the West coast of Africa.*

Ternstroemiopsis, Sandwich islands.

Eurya, (i) Mexico and the W. Indies to Venezuela.

(ii) India to the Pacific.

* This isolated species needs re-examination.

Freziera, S. America.

Vismia, Canary islands.

Tremanthera, New Guinea.

And from such a review of the genera, allied to *Gordonia*, we turn with at least the suggestion that discontinuous distribution is not so rare in the order as to afford any strong reason for Korthals' and Pitard's endeavour to cut the Asiatic *Gordonia*s from the American.

In fact what we have in the Theaceæ and Ternstroemiaceæ is such a noteworthy demand for damp air as to restrict them either to damp seaboards or to mountain forests or to rain forests that are not too hot. With a centre about the Pacific, local climates have ruled where they should persist, and the discontinuous distribution is because all but a small part of North America is too dry.

INSTEAD OF SPLITTING GORDONIA, IT APPARENTLY SHOULD BE
ENLARGED BY THE INCLUSION OF AT LEAST THE
ASIATIC SPECIES OF *HAEMOCHARIS*.

Not only do I fail to follow the bias, but I find characters contrary to Pitard's statement that *Nabiasodendron* has blunt capsules and *Gordonia* pointed, and instead of cutting down *Gordonia*, I believe that *Haemocharis*, at least in the East is not distinguishable from it; and I recommend that the two be examined with a view to union. The only difference is in the presence of a style in *Gordonia* and its absence in *Haemocharis*, a difference which puts *Gordonia singaporiensis* for instance on either side of the line accord-



Fig 2. Ovary of *G. singaporiensis* at the time of the fall of the corolla showing how undefined in the style.

ing to the view of the moment, and prompted the remark of Koorders and Vabton in regard to *Haemocharis integerrima* (*Mededeelingen 'S Lands Plantentuin* No. 16, 1896, p. 294) "stylis fere dimidio breviter connatis apice obtuse divergentibus, hæc species demarcationes inter genera *Gordonia* et *Lauracea* (*Haemocharis*) fere plane aufert," i.e. it comes within a trifle of breaking down the boundary.

There is one point to be set out before proceeding, namely that the Asiatic species of *Haemocharis* owe their position in that genus

in a very large part to Miquel. They are rare plants in herbaria, which seem to have been seldom consulted of recent years. There is consequently no consensus of modern opinion placing them where they are; and though Otto Kuntze changed the names of some, he was not working as a botanist but as a lexicographer. If the Asiatic species of *Hammoncharis* be transferred to *Gordonia*, the genus is enlarged by the following:—

H. vulcanica, O. Kuntze, (*Sphalm. vulcanica*) being Korthals' *Laplacca vulcanica*, described in 1840 or 1841 from Mt. Meropi in Sumatra.

H. marginata, O. Kuntze, first described in the same place as *Clasaschima marginata*, from Mt. Timu and from near Martapura in Borneo.

H. ovalis, O. Kuntze, first described along with the last two as *Clasaschima ovalis* from the forests of Melintang in Sumatra.

H. buxifolia, Szyszlowicz, first described by Miquel as *Laplacca buxifolia* in 1862 in his *Sumatra, zijne Plantenwereld* p. 482, from Pava Kombo in Western Sumatra.

H. aromatica, Szyszlowicz, first described by Miquel along with the last from Mangala in the Lampongs province, and also from Priaman, in Sumatra.

H. subintegerrima first described by Miquel along with the last two, from Kobylahat in the Province of Palembang, Sumatra.

H. integerrima, Koorders and Valetton, first described by Miquel in the *Annales Musei botanici Lugduno-Batavi*, iv, 1869, from Preanger in West Java.

H. amboinensis first described as *Laplacca amboinensis* by Miquel in the same place as the last.

H. serrata, Koorders and Valetton, described in *Mededeelingen van 'sLands Plantentuin*, No. 16, 1896, p. 296.

Of the genus Miquel remarks that it descends to low levels (*Sumatra, zijne Plantenwereld*, p. 483), but not in Java. So too does *Gordonia* descend to low levels in the Malay Peninsula, but not in India and Ceylon.

SIZE ATTAINED BY GORDONIAS.

The home of the American species of *Gordonia* is swampy hollows among the pines of the Pine barrens along the sea coast. The home of all the eastern species as far as recorded is sloping ground in dense rain forests and often on the crests of the ridges in these forests. On such crests the trees are apt to be dwarfed by conditions, and it is almost certain that foresters will soon show that the botanists who have described the plants have by far understated the sizes attained by many of the species. These are the sizes so far recorded:—

G. Welborni attains 50 meters or 160 feet.

G. singaporiana 43 meters or 120 feet.

G. excelsa 25 meters or 80 feet.

G. Lasianthus 24 meters or 75 feet.

G. obtusa 20 meters or 50 feet, or perhaps more.

<i>G. multifloris</i>	}	15 meters or 50 feet.
<i>G. Lybbii</i>		
<i>G. speciosa</i>		

<i>G. pinangensis</i>	}	12 meters or 40 feet.
<i>G. Mainyari</i>		
<i>G. sinensis</i>		

<i>G. luzonica</i> (<i>G. fragrans</i>)	}	8 meters or to 25 feet.
<i>G. Balansae</i>		
<i>G. pubescens</i>		

G. brevifolia 4 meters or 14 feet.

Ridley in the *Journal of the Federated Malay States Museums*, iv, 1909, p. 6, speaks of very large Gordoniae occurring on the upper ridges of the Telom district of Pahang. The species was not determined.

But unfortunately so many of these species are known from observation in but one or two localities, and again we know that flowering is no criterion of age, as in European gardens *G. Lasianthus* will flower at 8—10 feet, *G. pubescens* at 4—6 feet, and *G. acicularis* at 3 feet (see Nicholson's *Gardener's Dictionary* article Gordonia); and we know also that the first named may be reduced by conditions in its own home to a bush (see Sargent, *Manual of the trees of N. America*, 1905, p. 678). *G. singaporiana* also flowers as a bush. Almost all from the economic point of view are inadequately known.

There are no records of the rate of the growth of the eastern Gordoniae. Tree No. 1505 V, in the Botanic Gardens, Singapore,—*Gordonia singaporiana*,—is now 145 cm. in circumference at 130 cm. from the ground; and this dimension is here recorded that some observer in the future may measure it again. Its height may be, about 70 feet, and it branches high; but tree 1508 H, which is in the open, branches low down.

THE TIMBER.

The timber of *Gordonia Lasianthus* is stated by Sargent to be light, soft, close-grained, not durable, light red, occasionally used in cabinet making.

The wood of the eastern species finds a perhaps greater appreciation. Beddome (*Flora Sylvatica*, 1874, under t. 83) wrote of *G. obtusa* that the wood is "white with a straw tint, even grained and pleasant to work, not unlike beech; very generally used for planks, doors, rafters and beams, but warps if not well seasoned." In the *Indian Forester* in, 1876, p. 23, while stating that the timbers in the sholas or woods of the Nilgiri plateau are of less value

than those of the slopes, he named *Gordonia obtusa* with seven others, as being chiefly in use. Gamble, *Flora of Madras*, i, 1915, p. 80, says, wood reddish, hard, and close grained, but little used. Trimen recorded of the Ceylon *G. zeylanica* (*Handbook of the Flora of Ceylon*, i, 1893, p. 111) "wood red, smooth, hard, shining" and after this he adds words which imply that the carpenters up country in Ceylon are familiar with the use of it. Ridley quoting Mamgay, (*Agricultural Bulletin of the Straits and Federated Malay States*, i, 1901, p. 48) wrote of the Malayan *G. excelsa*, (but Mamgay though doubtless referring to a *Gordonia* may not have had *G. excelsa* before him), "Wood pale red, fine to medium grain, good for houses, beams and boats. Weight 59 lbs, 5¼ oz. and 65 lbs, 7½ oz." De Sturler, (*Cat. Descript des espèces de Bois de l'Archipel des Indes Orientales*, 1867, p. 16) stated that a *Gordonia* of W. Java* furnishes a reddish brown wood of great density employed by carpenters; and that it works well. On p. 36 under the name of Aylapia, he stated that a *Gordonia* of Amboyna gave a reddish wood, used but not durable.

Cantley's collector in Malacca in 1886 obtained *G. singaporiensis* with the note that the timber is used in house building and is durable. The same in 1885 noted of what appears to be *G. birtella* that the wood is a dirty dark colour, and its heart black, that it sinks in water and is used for house posts being very durable for this purpose.

Elmer while giving no uses for *G. Welborni* describes the wood as "hard, somewhat burly, and reddish."

Moll and Janssonius (*Mikrographie des Holzes der auf Java vorkommender Baumarten*, 1906, p. 334) described the structure of the wood of *G. excelsa*, from Koorders' material; and on p. 338 they described the wood of *Haemocharis integerrima*.

Whitford (*Forests of the Philippines*, part ii, 1911, p. 59) states that *Gordonia luzonica* is of no importance to the lumberman.

THE FOLIAGE.

All the *Gordonias* are evergreen. Foliation in *G. singaporiensis* occurs in flushes of about four leaves generally of increasing size, and the next leaf is small again, but the last leaf may be small especially if it subtends a flower; and leaves at various points may also be small subtending flowers. The leaves persist over more than a year, and there may perhaps be two flushes in the twelve months. At the top of the forest their length may be 15 cm., but young trees in shade carry leaves as much as 35 cm. long, by 10 cm. in breadth.

Along the margins of the leaves of *Gordonia*, when expanded, little blackish bodies may be seen, which if the leaf has teeth are on their apices, but are not absent if the teeth be so. These are

* This is more likely to be *Haemocharis integerrima* than *Gordonia excelsa*. Both have the same vernacular name—Kimandjel.

mucilage glands, whose function is to keep the young tissues from injury while still packed in the bud. When the leaves expand, they are already dead in the Asiatic species but I have seen them to be still alive on young expanded leaves of the American *G. pubescens*, and perhaps their structure differs. It is interesting to link this protective function with the demand that the tree makes for moist air. A little nerve runs out to the glands. This same type of gland occurs in allied genera such as *Adinandra*, as in *Gordonia imbricata* and *G. Scottellianii*, where the leaves are toothless. The apex to the leaf also is glandular, and dies as or before the leaf unfolds, often leaving an emargination. Some of the earlier botanists have tried to make a character of this emargination, but the degree to which it has gone on any particular leaf may be but a response to local or to temporary air conditions. Reference may be made to fig. 15, on p. 158, where two flushes are represented. At the commencement of the first, weather conditions appear to have been such as to destroy with the apical gland quite a distinct piece of the neighbouring tissues: these conditions were not repeated. Hairs are present on the young parts which vanish like the glands more or less completely with age; in the leaf bud they are protective similarly. They afford no good specific characters.

THE FLOWERS.

Flowers are formed on very short axillary shoots in the upper leaf axils of a flush or in the axils of cataphyllary leaves following. If the terminal bud should die they appear as if terminal on the foliar branches, and this seems particularly to happen in *G. panangensis*. In this species the weight of a falsely terminal capsule on the rather slender branchlets makes it to hang; but in most species they dehisce upwards, see fig. 7 of *G. hirtella*.

The Gordonia, as said, may be got to flower at relatively small sizes. No information is available as to subsequent seed-formation; but in Singapore *G. singaporiensis* already seeds at a height of 6 meters.

No information is available as to the formation of flowers in *Gordonia* sexually imperfect, except that a female condition was found in the first observed plant of *G. acillaris*. However as Urban (*Berichte d. deutsch. bot. Gesellschaft*, xiv, 1896, p. 51) has found male and female flowers in the Tropical American species of *Haemocharis*, the occurrence of sexually imperfect flowers in a *Gordonia* is hardly isolated. Further Urban ascribes to the male flower a short style, which makes the definition between *Gordonia* and *Haemocharis* just nothing.

The old trees of *G. singaporiensis* in the Botanic Gardens, Singapore, have their flowers fully hermaphrodite. They open in the evening or after dark, facing horizontally or slightly downwards, and fall during the next forenoon. They have a smell which is fairly strong, but hardly fragrant; they are in colour creamy white; they are produced over many months of the year. Infertile

flowers perish in the horizontal position of flowering: fertile capsules however resume a more or less upright position and the mature capsule dehisces on the tree facing more or less upwards. It is hygroscopic, closing slowly if wetted and opening slowly again when dried. The walls of the loculi fit over the seeds very closely so that these escape with difficulty, and it is quite common for the capsule to fall to the bottom of the forest with them still enclosed.

THE SEED AND SEEDLING.

The germination of *G. singaporiensis* has been watched. In it the seed coats are split along the longer free margin of the seed and the radicle is extruded. When this has anchored the cotyledons are raised up and with them the seed coats, from which they escape in consequence of their efforts to attain a more or less horizontal position.

The cotyledons are somewhat arched, and are without the mucilage-glands of the later foliage. With our present scant know-

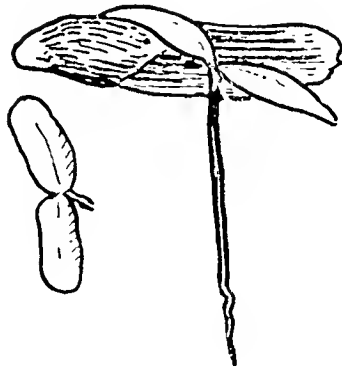


Fig. 3. Seedling of *G. singaporiensis* with the cotyledons freeing themselves from the seed coats. To the left are the cotyledons seen from above.

ledge of the species of *Gordonia* the characters of the foliage help us more than anything else to a scheme of classification, probably in no way because they are the best, but because we know too little about the capsules. As regards the latter not only do we suffer from the circumstance that from many of the species they have not been collected yet, but also from the fact that the differences in them are difficult to bring out in descriptions unaccompanied by drawings. Towards a remedy the following line blocks may do a little. The next proceeding towards understanding the genus, apart from the collecting of more material, is a re-examination of the Sumatran and Bornean types in Dutch herbaria.

THE KNOWN SPECIES OF GORDONIA AND THE ASIATIC SPECIES
OF HAEMODIARIS.

The most outstanding species of the whole genus is the North American *G. pubescens*. The following enumeration will be started with it.

***Gordonia pubescens*, L'Héritier**, *Stirpes novae*, 1784, p. 156. *G. Altamaha*, Sargent, *Manual Trees*, N. America, 1905, p. 679.

This species used to be found on the Altamaha river in Georgia but has long been extinct in a wild state. Its leaves have a conspicuous venation. Its flowers are 8 cm. in diameter on short peduncles. Its stamens are inserted separately, and their length relative to the size of the flower is small. The ovary is "truncate and crowned with a slender deciduous style nearly as long as the stamens." The capsule is globose and septicidal from the base. Its seeds are very characteristic, sharply defining it from all other *Gordonias*: for they are wingless.

There is a line figure of it in Sargent's book.

***G. Lasianthus*, Linnaeus**, *Mantissa* 1771, ii, 570: Sargent, *Manual Trees*, N. America, 1905, p. 678: in foliar characters lies close to the above: the venation is distinct. The flowers are on long peduncles slender below, but thickening to the flower: they are 6-8 cm. in diameter, white, and with the relatively short stamens united into five bundles at their insertion. The ovary is "gradually contracted into the stout style." The capsule is ovoid and the seeds are winged. Its distribution is from Maryland all along the pine barrens of the Atlantic coast into the Gulf of Texas to the mouths of the Mississippi.

Sargent gives a line figure of it.

***Gordonia sinensis*, Hemsley and E. H. Wilson**, in *Kew Bull.* 1906, p. 153, is described by the authors as of Asiatic *Gordonias* the most nearly allied to the American species. It has leaves with veins prominent on both surfaces. The white flowers are described as about 5 to 6.5 cm. in diameter. But its capsule is unknown. The petiole is up to 1.5 cm. long. The stigma is said to be "capitate."

Mr. E. H. Wilson got it in the forests of Mt. Omi, Szechuen, Western China.

***G. penangensis*, Ridley**, in *Journ. Straits Branch. Roy. Asiatic Soc.*, No. 73, 1916, p. 142: *G. excelsa*, King, in *Journ. Asiatic Soc. Bengal*, lix, 1890, p. 203, not of Blume.

This species is noteworthy for the slenderness of its branchlets which so bend under the weight of the capsules as to make

them pendulous. Its leaves are rather small and the petioles for



Fig. 4. Foliage and flower of *G. penangensis*, reduced to $\frac{1}{2}$, from Curtis 834.

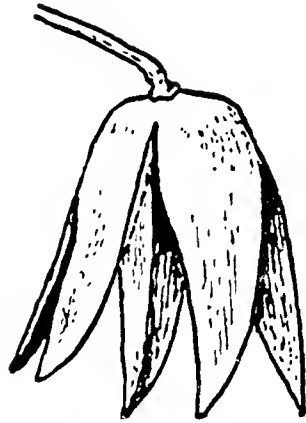


Fig. 5. Capsule of *G. penangensis* nat. size, from Curtis 834.

the genus longish. A little hair persists at maturity on the backs of the blades near to the midrib. Its flowers are 3 cm. in diameter and are described by Curtis as yellow and by Ridley as pinkish yellow. The ovary narrows into a long style. Curtis got it as a medium sized tree at 1,500 and 2,400 feet in Penang island. Ridley as a tall tree at about sea level at Seletar and at Chanchukang in Singapore island. It is to be noted that Pitard's character of blunt capsules for *Nabiasodendron* is not upheld by this species.

G. Maingayi, King, in Journ. Asiatic Soc. Bengal, lix, 1890, p. 204, is extremely near to *G. penangensis*; and the ovary narrows in the same way into the style.

It was obtained first by Maingay who collected in Malacca, and then by Scortechum and Wray who collected largely in the hills near Taiping but did not record their localities. I have not seen Maingay's plant.

G. taipingensis, one of the new species here described, has large leaves and large flowers. In outline the leaves agree with those of *G. penangensis*.

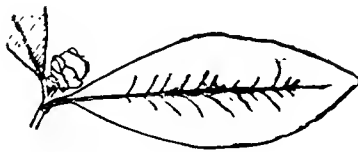


Fig. 6. Leaf and bud of *G. taipingensis*, reduced to $\frac{1}{5}$, from the type specimen R. A. Soc., No. 76, 1917.

Gordonia taipingensis, *Arbora*, 40- vel 50-pedalis, cortice avellaneo-umbrina. Ramuli ultimi 3 mm. crassi, fusco-avellanei. *Folia* elliptica ad elliptico-obovata, basi attenuata, apice acuminata, pergamentacea, margine in superiori parte solum inconspicue ciliolata, venis lateralibus supra atque infra visibilibus, glaberrima, ad 29 cm. longa, ad 7 cm. lata; petioli crassius, ad 2 cm. longius. *Flores* majusculi diametro 6 cm., lutescentes. *Stylus* dense sericeo, maxima 15 mm. longa. *Petala* dense sericea, ad 3 cm. longa. *Andræa* numerosissima, versatiles, tere 2 mm., longae; filamenta basi pubescentia, 7—9 mm. longa, capsula deserta in actalis conjungites inserta. *Ovarium* dense sericeum apice in stylo angustatum, vix 1 cm. longum stylo 2 mm. et stigmatis 2 mm. longis inclusis. Capsula ignota.

Pinak. In monte Taipang hill cuncta ad 3,500 ped. alt., cum floribus mense Februario collegereunt Mohamed Haniff et Mohamed Nur, sub numero 2359.

G. obtusa, *Wallich.*, Cat. Linn. 1832, No. 1459, nomen only; Wight, Illustr. 1840, i. p. 99. Dyer in Hooker n. l. Flora Brit. India, i. 1875, p. 291; Gamble, Indian Timbers, p. 67. Tallot, Forest Flora Bombay, i. 1909, p. 106; Gamble, Flora Madras Pres., i. 1915, p. 79. *G. obtusifolia*, Wight, loc. cit.

This is clearly near to *G. Maindara*, as Sir William Tinsleton Dyer pointed out. The flowers are larger and the leaves harsher. The colour of the flowers is creamy white and their diameter about 7.5 cm. The ovary is represented as narrowing into the style, and the style as being tubular almost to the top of the ovary. Sometimes the stigma is 4-lobed. It is a common tree in the little patches of forests which occur in the ravines of the Nilgiri hills chiefly on the eastern side, between 5,000 and 7,000 feet. From the Nilgiri hills it extends southwards and reaches lower levels on the damp western face of the Travancore slopes; also it reaches the Bababuden hills in Mysore.

Wight gave the name *G. parvifolia* to a plant which he obtained in Courtallam with smaller leaves and their margins almost toothless, but later botanists who have had a right to an opinion, have considered it as not distinct from *G. obtusa*.



Fig. 7. Cap-sule of *G. hastata*, slightly reduced, from Ridley 7350.

G. hirtella, *Bulley*, in Journ. Straits Branch, Roy. Asiatic Soc., No. 73, 1916, p. 112, has foliage like that of *G. taipingensis*, but is widely different in its smaller flowers (only 2 cm. in diameter) and smaller leaves (up to 14 cm. in length). The capsules of *G. taipingensis* being unknown, the comparison cannot proceed to them, but in *G. hirtella* as the drawing shows they are small and the lobes after dehisence are finger-like. The ovary narrows gradually into the style.

G. hirtella occurs on the Central Chain of mountains of the Malay Peninsula from Gunung Batu Puteh in Perak to the west of Taroeh, where Wray got it at his lower camp (Wray No. 116) through Bukit Katu in Selangor at 3,000 feet, (Ridley 7350) to Bukit Etam at the same height (Kelsall 1848) on the Selangor-Negri Sembilan boundary. Further there is a specimen which appears to be it in the Singapore herbarium collected for Cantley (No. 1296) at "Kandong" (a which name is probably indicated the Kendong in Negri Sembilan lying close to the foot of Gunung Tampin). Cantley's collector stated that the heartwood is black, and the albumen dark in colour, and that it makes very durable house posts.

The flowers are creamy white.

G. tonkinensis, *Pitard*, in Lecomte, Flore générale de l'Indo-Chine, i, 1910, p. 318, by the description appears to lie near this place in the sequence. Its elliptic leaves attain 13 cm. in length, and have small crenulations sometimes towards the apex. They have a petiole up to 1 cm. in length, and the venation is almost totally obscured by the coriaceousness of the leaf-blade. Pitard gives a figure of the small capsule, which in shape is not unlike the unexpanded capsule of *G. hirtella*, but from his description is yet smaller by one third.

The flowers are unknown. Abbé Bon collected it near Ninh binh in Tonkin, *i.e.*, not far from the coast.

G. luzonica, *Vidal*, Revis. Pl. Vasc. Filip., 1886, p. 57. *G. fragrans*, Merrill, in Philippine Journ. Science, i, Suppl., 1906, p. 95.



Fig. 8 leaf of *G. luzonica*, reduced to $\frac{1}{6}$ from Borden 809.

With this species we begin distinctly to approach those where the petiole is scarcely present: Merrill in describing it gives the length as 5 mm. or less. The blades of the leaves are oblong lanceolate, the broadest part being not yet carried above the mid length; the margins have obscure crenations in the upper part; the nerves are not so obscure as in many species, the degree being much as in *G. hirtella*. The white flowers are fairly large (5 cm. in diameter), and are fragrant. The ovary is oblong-ovoid. The capsule in shape is very like that of the *G. lanceifolia* figured below, and is described as 3 cm. long.

G. luzonica appears to be not uncommon on the mountains not remote from Manila bay.

I have before me a specimen from Baguio in the Province of Benguet, Luzon, (Curran 5983) which in its foliage and capsules appears to be distinct from *G. luzonica*. The leaves carry a large amount of hair, and are broader than those of *G. luzonica*; the capsules are 4 cm. long and so larger. The Baguio country is a country of ravines with at the best scrubby forest and without the true rain forests in which *G. luzonica* lives usually. It is true that *G. obtusa* occupies somewhat similar regions in the Nilgiri hills as well as places in the rain forests towards the Arabian Sea, so that the different situation is no base for a case; but the different appearance of the specimen calls for an examination of more material.

G. Welborni, *Elmer*, *Leaflets of Philippine Botany*, ii, 1908, p. 591, appears like an exaggeration of *G. luzonica*. It is described as the largest in growth of all the Gordoniae (30 to 50 metres in height), with a straight trunk a metre thick. The leaves attain a length of 15 cm., which is not larger than those of *G. luzonica*; nor are they relatively wider, but the flowers have petals 3 to 4 cm. long so that their diameter must be 8 cm. The stamens however are described as relatively short. It is to be inferred from the description that the ovary contracts to the style. The flowers are creamy white.

Elmer got this species in the island of Negros in the Cuernos mountains at Dumaguete, and he records that Mrs. Clemens had found it at 4250 feet in the Lanao region of central Mindanao.

G. lanceifolia, a new species, comes near to *G. luzonica*. It has leaves of the same outline but more nearly entire, and differently veined. Its capsules terminate leafless branchlets which may be 4 cm. long. It occurs in Borneo near Kuching.

Gordonia lanceifolia. *Arbor sempervirens.* Rami ultimi pennae corvinae crassi, siccitate nigricantes, glaberrimi. Alabastra externe glaberrima. *Folia* glaberrima, anguste elliptica, vel ad apicem vel in petiolum longe admodum aequaliter angustate subacuminata, margine fere integro levissime recurvo, in siccitate rufo-

nigrescentia, pagina inferiore pallidiore, ad 14 cm. longa ad 3.5 cm. lata: nervi secundarii visibiles, subrecte in arcum intramarginalem incurrentes: petiolo 3 mm. longus. Flores ignoti. Capsulae ramos ad 4 cm. longos terminantes, ad 3 cm. longae, in partes quinque loculiculae dehiscentes, partibus dorso concavis, sericeis, basi 10 mm. latis deinde gradatim in apiculum angustatis. Semina 25—27 mm. longa.

BORNEO, prope Kuching, collegit G. D. Haviland sub numero 1010.



Fig. 9. Leaves of *G. lanceifolia* reduced to $\frac{1}{2}$, and capsule, natural size, from the type specimen.

Haemocharis integerrima, *Koorders and Valeton*, has leaves in shape like those of *G. lanceifolia*, but thicker, with the veins obscured. It occurs in the mountains throughout Java between 2,400 and 7,000 feet.

H. serrata, *Koorders and Valeton*, is contrasted by the authors with the above, and said to differ in its more prominent serrations near its leaf apex, its larger flowers, and hairy style (sic!). It was obtained on Gunung Pulasari in Java.

Haemocharis aromatica, though said to be near *H. vulcanica*, by Miquel, possesses a less marked montane appearance. Its leaves are very minutely subcallously serrulate and have veins which can be traced by being depressed above. No statement is made of the absence of style. If a *Gordonia* the description appears to place it here.

It was got in two varieties in Western and Southern Sumatra.

G. Balansae, *Pitard*, in *Lecompte, Flore Générale de l'Indo-Chine*, i, 1910, p. 348, is described as having leaves elliptic to

obovate, dentate, coriaceous, and so small as to be only 5 to 10 cm. long by 1.5 to 3.5 cm. broad. The dentation removes the species from the neighbourhood of the small leaved Malayan species with which this enumeration will end. At the same time the petiole for the smallness of the blade is rather long (2 to 8 mm.). The flowers are yellowish, and apparently about 3 cm. across. The ovary is of the lobelioid only, and is contracted into the style. The capsule is represented by Pittard as oblique. If this curious condition is at all constant it is very interesting, and a relationship of some closeness to *G. amomala* is suggested thereby.

G. Balansae was collected in the forests of Mount Bani in Tonkin near to the village of Sougi by the collector Balansa.

G. axillaris, *D. Dietrich*, Syn. Plant. iv, 1859, p. 863; Szyszylowicz in Engl. Pflanzenfam. iii, No. 6, 1893, p. 185. *G. amomala*, Sprengel, Systema, iii, 1826, p. 126. Benthani, Flora Hongkong, 1861, p. 29; Forbes and Hemsley in Journ. Linn. Soc. Lond. Bot. xxxiii, 1886, p. 89. *G. Lessertii* Szyszylowicz in Engl. Pflanzenfam. iii, No. 6, 1893, p. 185. *Carollia axillaris*, (Roxburgh very doubtfully, R. Brown more probably, through Ker in Bot. Register, 1819, plate 349, and Sims, Bot. Mag., 1819, plate 2041. *Palisaura axillaris*, Sweet, Hort. Brit. ed. 1, 1826, p. 61; Don, Dict. Gard. and Bot. 1, 1831, p. 574; Hooker in Bot. Mag. 1843, plate 4019.

This species with elliptic toothed leaves, and a short but distinct petiole, has an ovary which may be made of four or of five carpels. In this perhaps is an indication of affinity to *G. Balansae*. Its flowers are white, and large (6 to 7 cm. in diameter; or according to the Gardener's Chronicle, lxi, p. 250, the flowers recently produced at Kew, 12 cm.). The ovary contracts to the style.

Benthani supposed the plant confined to the island of Hongkong, as he was unable to ascertain any record of its occurrence on the mainland of China.

Matsumura and Hayata, have recorded it from two places in the extreme north of Formosa and from one very near the middle of the island. The old errors of placing its home in Penang should have been forgotten by now, but persist; and Singapore is added equally incorrectly.

G. concentricatrix, a new species from the lowlands between the Iundings and Malacca, is the first of two in which the broadest part of the leaf is very markedly towards the apex. It occurs as a big tree in the Selangor forests with a clean straight trunk marked by concentric rings which it is hoped to figure later.

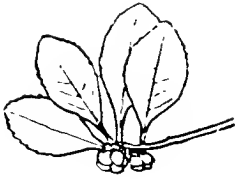


Fig. 10. A branch of *G. concentricatrix*, reduced to $\frac{1}{3}$, from Abdul Rawi. C. F. 878.

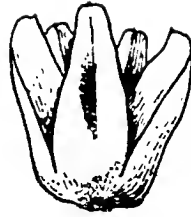


Fig. 11. A capsule of *G. concentricatrix*, nat. size from Abdul Rawi. C. F. 878.

***Gordonia concentricatrix*.** *Arbor* alta 100-pedalis, cortice inaequali lineis concentricis rotata. Ramuli ultimi 2 mm. diametro, sic citate badii. *Folia* obovata, margine crenulata, apice abrupte subacuminata vel obtusissima, basi longe gradatim attenuata, glaberrima, crasse pergamentacea nervis secundariis visibilibus, ad 11 cm. longa, ad 5.5 cm. lata; petiolus ad 1 cm. longus. *Flores* lutescentes, ad 1 cm. diametro. *Sepala* dorso dense sericea, ad 1 cm. longa. *Petala* dorso dense sericea, tere ad 2 cm. longa. *Anthora* numerosissima, versatiles, 2 mm. longae; filamenta glabra, omnia discreta ad insertiorem cum petalis in tubo brevi. *Ovarium* dense sericeum, subglobosum, subabrupte in stylo 3 mm. longo excurrent. *Capsula* subsessilis, tere ad 4 cm. longa, in partes quinque loculicide dehiscent, partibus (inter species affines) crassis, dorso dimidio superiori impressis, vix mucronulatis. Semina 2 ad 2.5 cm. longa.

PENINSULA MALAYANA, in silvis submontosis versus Fretum Malaccaë, ex Dindings, collegit C. C. Curtis cum fructu mense Julio; ex Selangor ad Rantau Panjang collegerunt J. G. Watson, C. F. 878, etiamque Abdul Rawi sub numero C. F. 878 mense Aprilo et mense Mayo cum floribus et cum fructibus; ex Malacca ad Brisu collegit R. Derry cum floribus sub numero 1048. Indigenae ad Rantau Panjang *Kelat merah* vocant, sed ad Brisu *Samak pulut*.

It is to be enquired if ***Haemocharis marginata*** (Korth.) O. Kuntze, is not of this affinity. Its leaves are described as oblong-oval or oblong-obovate and though put into *Closaschina* by the author the style is described by him as "5-angled, 5-grooved, silky and short" which fits such an admitted *Gordonia* as *G. singaporiensis* excellently. It was obtained from Mt. Tirin and from Matapura in Borneo.

Haemocharis subintegerrima, has leaves lanceolate oblong to obovate oblong. As in the case of the above the mention of obovateness suggests a place near to *Gordonia concentricatrix* but its veins are obscured, and the marginal teeth nearly

obsolete. Kurz says that it hardly differs from *H. aromatica*, and is the same as *Gordonia Mainqahi*, which appears dubious. It was obtained in Sumatra at Kohn-lahat in the Province of Palembang.

G. multinervis, *King*, in Journ. Asiatic Soc. Bengal, lix, 1890, p. 205, ends the series to which it belongs, being peculiar in the great size of its leaves. It has been collected in Perak and in Singapore. As the attached figure shows the veins in the leaf-blade are not inconspicuous, a feature shared with *G. concentricatris*. The flowers are only a little over 2 cm. in diameter and agree with those of *G. concentricatris*. Sir George King called attention to the resemblance of its leaves to those of the genus *Pyrenaria*.



Fig. 11. A leaf of *G. multinervis*, reduced to $\frac{1}{2}$, from Ridley 6367

G. singaporiana, *Wallich*, Cat. Lath., 1832, No. 1457, name only; Ridley in Journ. Straits Branch, Roy. Asiatic Soc., No. 73, 1916, p. 111: *G. coccinea*, var. *singapuriana*, Dyer in Hooker fil., Flora Brit. Ind. i, 1872, p. 291: *G. grandis*, King, in Journ. Asiatic Soc. Bengal, lix, 1890, p. 203, non André. In this species the petiole is almost absent, and the leaf blade very nearly entire. In its subsessile leaves it is easily distinguished from all other Malayan species, but in Ceylon we find allied trees with such leaves. The flowers which are 3 cm. across, have been figured above (p. 133), and the ovary with its abbreviated style (p. 140); the leaf and a capsule are figured below. Kurz saw that it is not Blume's plant, but misidentified it with *Gordonia axillaris*.

It occurs in Singapore island, in Johore, in Malacca, and in Penang.



Fig. 12. A leaf of *G. singaporiana* reduced to $\frac{1}{2}$.

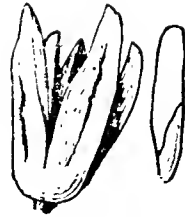


Fig. 13. A capsule of *G. singaporiana* and a seed from life, nat. size.

G. dipterosperma, Kurz, in Journ. Asiatic Soc. Bengal, xlv, 1876, p. 119: *G. excelsa* var. *pubescens*, Dyer in Hooker fil., Flora Brit. India, i, 1853, p. 291: *Gordonia* sp., Griffith, Posthumous-papers, ii, p. 99 and iii, p. 200: *Dipterosperma* sp., Griffith, Notulae, iv, 1854, p. 561.

It appears right to separate this from *G. excelsa*, as Kurz did. Kurz wrote "Blume's tree differs so much from the above in the long peduncles, large hirsute capsules, and in the texture and pubescence of the leaves, that it is difficult to understand how it could have come to be identified with the Khasi and Sikkim tree." Ridley (in this Journal No. 73, p. 142) has called attention to the large pustules from which the hairs spring on the backs of the leaves. It was collected first by Griffith at Dewangiri where he entered what is now Bhutan, and then afterwards in the Khasi hills by Kurz. Mr. C. C. Calder, Curator of the Herbarium of the Royal Botanic Gardens, Calcutta, has been so good as to refer to all the material that he possesses and to tell me that it has been obtained in additional localities in British Sikkim.

G. excelsa, Blume, Bijdragen, iii, 1826, p. 130: Koorders and Valetton in Mededeelingen Nederlandsche Plantentuin, No. 16, 1896, p. 289: Koorders, Excursionsflora von Java, ii, 1912, p. 608: Koorders-Schumacher, Systemat. Verzeichnis, fam. 180, p. 35. *Antheeschima excelsa*, Korthals, Verh. Nat. Gesch. 1839-42, 138, t. 27.

Koorders points out that the margin of the leaves varies considerably, being toothed sometimes and sometimes not toothed. The flowers, Ridley points out, are twice as large as those of *G. singaporiana*. Koorders describes the appearance of the tree as characteristic, the young stem up to 50 cm. in diameter having a peculiar thin sloughing "brown-red-grey" bark. *G. excelsa* was obtained by Blume in the mountains of Western Java; it was obtained by Koorders on Gunong Salak in Western Java and in the Pantjur-Idjen region of East Java.

G. zeylanica, *Wight*, *Illustr.*, i. 1840, 99: Thwaites, *Enum. Florae Zeylan.*, 1864, p. 40: Dyer in Hooker *fil.*, *Flora Brit. India*, i. 1873, p. 291: Trimen, *Handbook Flora Ceylon*, i. 1893, p. 110.

The almost sessile oval or oblong lanceolate leaves of this species distinctly suggest *G. singaporiensis* but they are shorter, firmer and the margins are markedly revolute often. Its white flowers are large, being 7.5 cm. in diameter. The capsules are rather over 3 cm. long. It occurs in many places about the mountains in the centre of Ceylon between 4,000 and 7,000 feet.

G. elliptica, Gardner, in *Calcutta Journ. Nat. Hist.*, vii. 1846, p. 448, is regarded by Trimen as a variety of *G. zeylanica* with shorter leaves and larger flowers. It occurs at one place in the same region as *G. zeylanica*.

G. speciosa, *Choisy* in *Mémoires de la Société Physique de Genève*, xiv. 1855, p. 52: Thwaites, *Enum. Florae Zeylan.*, 1864, p. 40: Dyer in Hooker *fil.*, *Flora Brit. India*, i. 1873, p. 292: Trimen, *Handbook Flora Ceylon*, i. 1895, p. 111. *Carria speciosa*, Gardner in *Calcutta Journ. Nat. Hist.*, vii. 1846, p. 7.

By its large deep crimson flowers this is a most outstanding species. Its long ovate leaves are almost sessile or even sessile; they are entire and the margin often revolute. The flowers are nearly 10 cm. in diameter, and its capsules nearly 5 cm. long. The stamens are united into five groups.

It formerly occurred gregariously in the forest above Rambodde in Ceylon at about 4,000 feet, where clearing has been extensive and made it very rare.

G. Lobbii, *Hooker fil.*, in *Trans. Linn. Soc. London*, xviii. 1860, p. 162, may be taken conveniently as the first of the last group of the genus, a group made of species with relatively small leaves whose margins are even and whose general facies suggests ability to withstand adverse conditions. It is a small or medium sized tree, with elliptic harsh entire leaves attaining 9 cm. in length, and 5 cm. in width. The expanded flower is only 2 cm. in diameter. The ovary is described as globose. It was collected by Lobb "ad Sarawak" which would mean near Kuching.

G. Havilandii, a new species, comes very near to *G. Lobbii*, and was obtained near Kuching. It differs in its petioles and its filaments, points which on further study may be found perhaps not worthy of the stress laid on them here. But until we have ob-

tained the material needed for bridging the differences, they must be recognised.



Figure 14. A leaf of *G. Havidandii* reduced to $\frac{1}{4}$ from Haviland 67.

Gordonia Havidandii. *Frutex* vel *arbor*, cortice ramulorum avellaneus. Ramuli ultimi 3 mm. diametro. *Folia* exacte elliptica, basi fere subacuta vel obtusa, apice aequaliter rotundata vel obtusa ad acumen breve obtusum, crasse pergamentacea, margine laevi decurvo, glaberrima, ad 12 cm. longa, ad 6 cm. lata: *Sepala* dense flavo-sericea, ad 1 cm. longa. *Petala* dorso dense flavo-sericea, 1.5 ad 1.8 cm. longa. *Antherae* numerosissimae, versatiles, 2 mm. longae; filamenta basin versus pubescentia, 1 cm. longa, discrete cum petalis inserta. *Ovarium* subglobosum, sericeum, in stylo 8 mm. longo gradatim protensum. *Capsula* immatura 1.5 cm. longa visa, matura ignota.

BORNEO. In Statu Sarawak, monte Serapi, 2800 ped. alt. collegit Haviland sub numero 67, etiamque ad 3000 ped. alt. sine numero, etiamque in monte Singpi mense Decembri cum floribus sub numero 1995.

Haemocharis vulcanica, *O. Kuntze*, is described as if extremely like the last two species. It has oval or ovate-entire leaves of a similar size. But the description states that the stamens are sometimes in five groups, as in *G. speciosa* and the American *G. Lasianthus*. The ovary is described as ovoid which indicates a narrowing upwards to the five subconnate styles. Surely it is a good *Gordonia*! It was obtained on Mount Merapi in Sumatra.

G. imbricata, *King*, in Journ. Asiatic Soc. Bengal, lix, 1890, p. 204, has a distinctly zerophytic appearance. Two flushes of its foliage are figured below. The leaves are seen to be small and entire. They are harsh and thick with the margins slightly revolute. The flowers are only 2.5 cm. in diameter. The ovary

narrows into the style. It occurs on the mountains of Pahang, both on Gunung Tahan and Gunung Benom at Kuala Terbang.

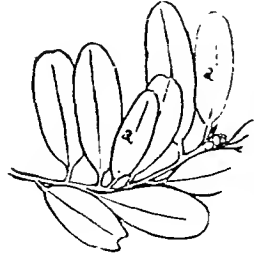


Figure 15. A branch of *G. malaccata* showing two flushes, a. n. the periodic reduced leaves, reduced to $\frac{1}{4}$ from Ridley, 16021.

G. Scortechinii, King, in Journ. Asiatic Soc., Bengal, lix, 1890, p. 24, might be described as *G. imbricata* with an admixture of *G. Malingqi*. Its branches however are more slender than in the first of these two and its flowers are recorded as remarkably small, the stamens being no more than 30. The locality whence it was obtained is unrecorded except as "Perak."

G. brevifolia, Hooker pl., in Trans. Linn. Soc. London, xviii, 1860, p. 162, is obviously a close ally of the last two. Its leaves are broadly ovate to obovate, with the condition of the apex varying. Its flowers are large, being nearly 4 cm. across. It was obtained on Mount Kinalabu in Borneo at about 8,000 feet.

Haemocharis buxifolia, Szyszylowicz, appears to be one of this set of Gordoniae, and the type specimen should be re-examined with this view. It was obtained in western Sumatra at Pava Komba.

Haemocharis ovalis, (Korth.) O. Kuntze, is the only species of which it is clearly said that the style is indistinguishable: "Stylus haud manifestus" are Korthals words; which together with his further statement "ovarium ovoideum, apice truncatum" do indicate such a condition as is in the American *Haemocharis*.

On this account I do not attempt to find a place for it among the species of *Gordonia*, but put it at the end. Its leaves are described as much smaller than the species around *G. luzonica* (7 cm. long by 2 cm. broad); but they are serrulate or crenate, and therefore not as those ending the series such as *G. imbricata*.

It was obtained in the forests of Melintang in Sumatra.

No attempt is possible at placing **Haemocharis amboinensis**.

Outstanding features in the genus are:—

- i. the septifragal capsule of *G. pubescens*,
- ii. the wingless seeds of *G. pubescens*,
- iii. the deep crimson colour of the flowers of *G. speciosa*,
- iv. the union of the filaments into five groups in *G. Lasianthus* and in *G. speciosa*; *Hameliocharis rubra* is said sometimes to exhibit this,
- v. the reduction of the number of the carpels sometimes in *G. arillaris* and in *G. Balansae*; and also in *G. obtusa*,
- vi. the distinctness of the veins in the two American species and in *G. sinensis*,
- vii. the obovate shape of the leaf in *G. concentricatris* and *G. multifloris*, with a moderate distinctness of the veins,
- viii. the slenderness of the branchlets in *G. pinangensis* and *G. Moingapi*,
- ix. the development of a montane small leaved type in the Malay Peninsula, Borneo, and apparently in Sumatra.

Notes on Dipterocarps.

No. 2, The Seedling and the Seed-production in some species of Shorea.

BY I. H. BURKILL.



Fruit of *Shorea leprosula*, slightly reduced : and the dehiscent capsule showing the sterilised loculi forming a partial septum intruding into the fertile loculus.

The ovary of *Shorea* has three loculi, and in each loculus are two ovules. But of the six thus presented in each flower, usually one only matures into a seed. As this one grows, it with its loculus extends round the central placentas, ending in wrapping within itself the two sterilised loculi. At seed-fall all endosperm has gone, and it is the fleshy inner cotyledon which does this wrapping. The radicle of the embryo is directed towards the apex of the loculus. Figure 2 is the embryo of *Shorea leprosula*, Miq., seen from the basal end of the loculus, showing how the two cotyledons lie doubled round the placentas (pl.) one being outside the other.

The figures here reproduced have all been drawn with the aid of a camera, and are proportionately accurate.

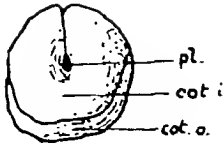
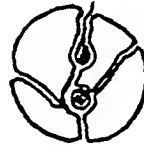
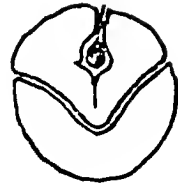


Figure 2. The embryo (3) (from the basal end of the fruit). *pl.* placenta; *cot. i.* inner cotyledon; *cot. o.* outer cotyledon.



Figs. 3 and 4. Fig. 3 (above) the embryo is section near the rounded end of the seed. Fig. 4, (below) the same toward the pointed end.

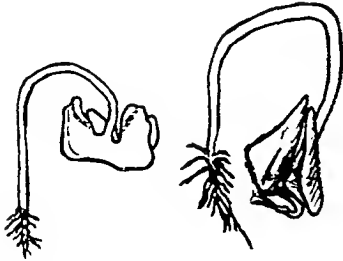
The outer cotyledon (*cot. o.*) when seen from this point of view, appears to be very much less bulky than the inner and is indeed a little less bulky. Each is two-lobed (see fig. 8), these lobes being packed in the seed in the upper half of the loculus, where they surround the radicle.

On cutting the embryo transversely near to the end which is represented in figure 2, the two cotyledons are seen doubled round the placenta as in figure 3. But when we take a transverse section towards the other end, we get their lobes in section surrounding the radicle and hypocotyl as in figure 4, the two lobes of the inner cotyledon embracing the placenta.

At maturity when the shuttle-cock-like seed falls, spinning into the sparse herbage and leaves on the floor of the forest, the embryo plant is full of chlorophyll and in such a state that it must germinate without delay or die. By reason of the way in which it falls, there is a considerable probability that it comes to rest with the radicle directed upper-most, and a certainty that it will not be directed downwards. The seed germinates: the cotyledons by growth and in straightening themselves rupture the thin ovary wall and seed coats, not along two constant lines but along two lines from top to base on opposite sides, generally rather more than 180° removed from each other on the side of the partial septum, so that this portion of the husk is rather larger than the other: then the hypocotyl elongates and curves to direct the radicle into the soil (fig. 5): if the radicle succeeds in anchoring, a tendency in the hypocotyl to straighten itself which now succeeds to the other, pulls the cotyledons from the loosely imprisoning fruit-walls, and the stage which is seen in figure 6 passes over to that seen in

figure 7. If there happens a most unlikely occurrence in nature,—that the cotyledons cannot be pulled out, and the root does not hold, the latter by the straightening of the hypocotyl is raised up into the air, and held.

The cotyledons at this time move so as to become nearly horizontal and stand thus unless as not seldom happens their lobes engage, when they remain face to face as figure 6 indicates.



Figs. 5 and 6, *Shorea leprosula*
the root being placed in the
earth.

A glance at figure 4 shows that any impression of the placentas will be on the lower surface of the inner cotyledon only, but that impressions of the radicle may be on the lobes of both. In figure 5 the impression of the placentas is seen crossing the lobes of the inner cotyledon; and in figure 8 the impression of the radicle may be observed.

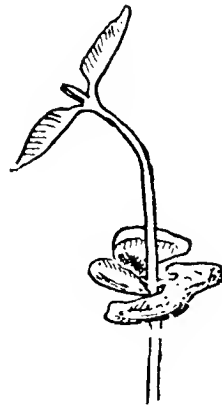
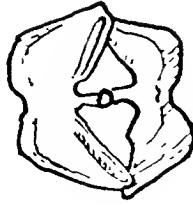


Fig. 7, *Shorea leprosula*, reduced to
 $\frac{1}{2}$, at the expanding of the first leaves.

Figure 6 shows that the outer cotyledon retains more of its humped shape than does the inner cotyledon; and it is the straightening of the inner cotyledon which more than anything else appears to burst the fruit wall,—an interesting slight differentiation of function.

Fig. 8. The cotyledon^s
of *Shorea apiculata* from
above. $1\frac{1}{2}$.



At the stage reached in figure 7 the first pair of leaves are ready to expand; and at this stage the heliotropism exhibited by the young plant is considerable. The plant figured had been illuminated from one side only.

It will be noticed in figure 7 that one cotyledon is raised by its petiole to a position slightly higher than that of the other; that one is the outer; and the different angle which it tends to take, may be connected with its greater bulk and less ability to flatten itself. The outer cotyledon stands higher than the inner also in other *Shoreas*.

Figure 9 is of *S. rigida*, Brachis, with the outer cotyledon to the left. Figs. 10 and 11 are of *S. macroptera*, Dyer, with the same orientation. Figure 12 is of *S. bracteolata*, Dyer, with the outer cotyledon on the opposite side. In all the outer cotyledon has taken up a position above the inner.

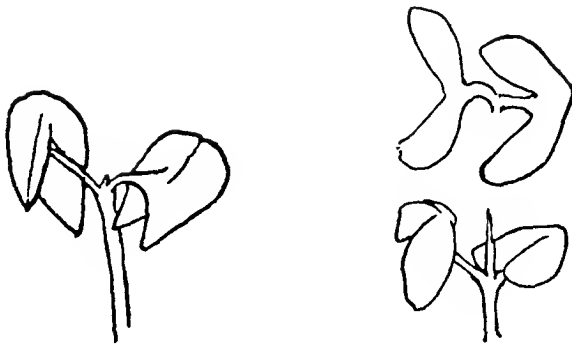


Fig. 9. Cotyledons of *Shorea rigida*. Fig. 10. Cotyledons of *Shorea macroptera* from above and from the side.

This outer cotyledon is least bulky in *S. bracteolata*, and most bulky in *S. macroptera*. The drawings indicate differences in shape; but until many more *Shoreas* have been examined in the seedling state, it is useless to endeavour to establish relationships between their shape and the sections of the genus.

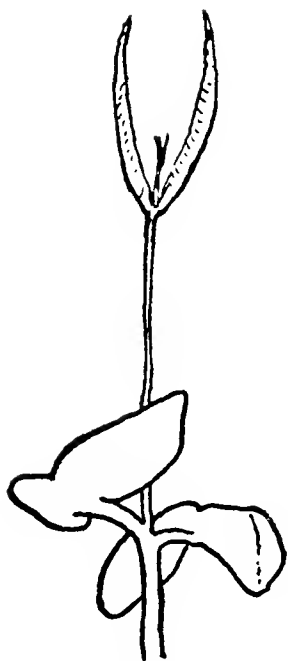


Fig. 11. A young plant of *Shorea macroptera* at the expanding of the first leaves.

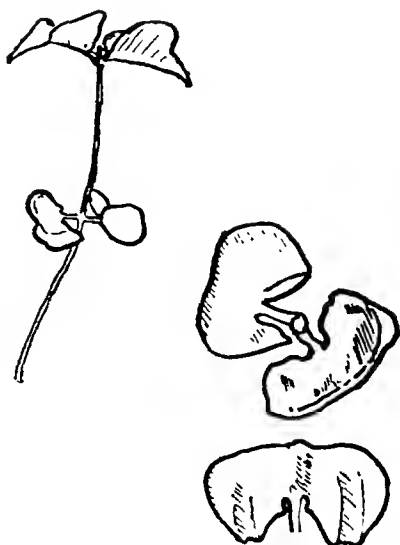


Fig. 12. A young plant of *Shorea bracteolata* and its cotyledons, both from above and the inner from below.



Fig. 13. A young plant of *Shorea gibbosa*.

All of these *Shoreas*, e.g. *S. leprosula*, *S. rigida*, *S. macroptera*, and *S. bracteolata*, have epigeal cotyledons with short petioles; but the Indian *S. robusta*, Roxb., differs greatly from them in having cotyledons capable of being hypogeal, with greatly elongating petioles, in which characters it approaches *Dipterocarpus*.

In the Botanic Gardens, Singapore, where *S. macroptera* is particularly abundant, many abnormal seedlings appeared in 1916. Some of these had three cotyledons, followed by three leaves in a whorl; some had three cotyledons followed by what may be called two and a half leaves (fig. 15) or by three and a half leaves (figure 16); and sometimes abnormally split leaves would follow the normal number of cotyledons (fig. 17). Notice was particularly taken of these in the wish to ascertain how *Anisoptera* (see this Journal v. 44) has a whorl of four leaves following the cotyledons.

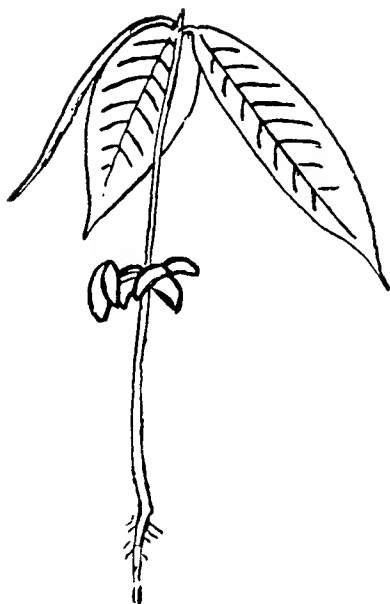


Fig. 14.



Fig. 16.

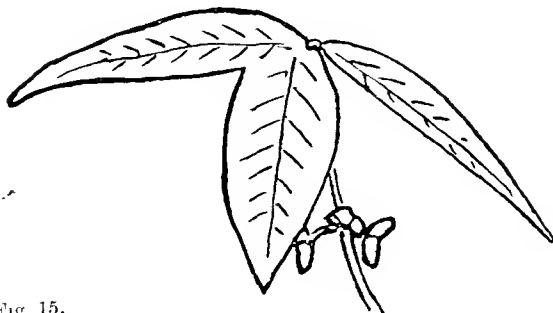


Fig. 15.

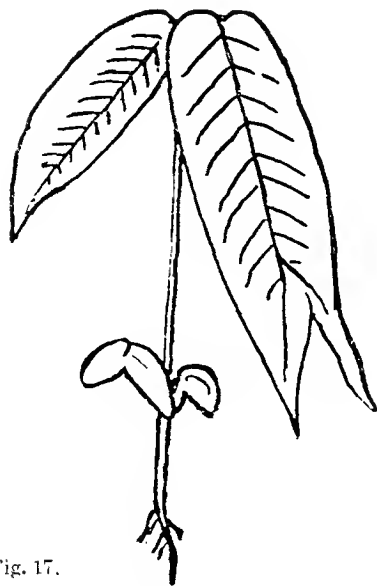


Fig. 17.

Figs 14, 15, 16, 17. Abnormal seedlings of *Shorea macroptera*.

The period from flowering to seed fall in the Shoreas, all except *S. bracteolata* being wild in the Botanic gardens, is about ten weeks in the case of *S. leprosula*, *S. rigida*, *S. macroptera* and *S. pauciflora*, about nine weeks in the case of *S. bracteolata* and *S. gibbosa*.

S. gratissima, Dyer, which in addition to those just named also occurs wild in the Botanic gardens, flowered in 1915 in three trees, at some little distance from each other, one being in area X, (No. 1239) the second in area U (No. 1237), and the third in area V (No. 1238); and it did not flower along with all the other species in 1916. But apparently it has flowered on earlier occasions at the same time as other species, and probably the conditions which lead to the flowering of all are very similar. One tree of *S. leprosula* which had not flowered in 1916, a young tree, flowered in 1917; clearing had been done round it in 1916 and it had received some injury during the work. There was consequently in its case a change of conditions which might account for the flowering. In the case of all the species, such records as exist in the Singapore herbarium suggest that flowering occurs in the first suitable season after three years have elapsed from the last heavy seed-crop.

In India *S. robusta* flowers in almost every year, but on the average one year in three only is a year of good seed.

[No. 78]

JOURNAL
of the
Straits Branch
of the
Royal Asiatic Society

June 15th, 1918.

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1918.

THE
STRAITS BRANCH
OF THE
ROYAL ASIATIC SOCIETY

Council for 1918.

Hon. Mr. C. J. Saunders	<i>President.</i>
W. George Maxwell, Esq., C.M.G.	<i>Vice President for Singapore.</i>
Lieut. Col. the Hon. A. R. Adams	<i>Vice President for Penang.</i>
Hon. Mr. A. H. Lemon	<i>Vice President for F. M. S.</i>
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Hon. Mr. Hayes Marriott	} <i>Councillors.</i>
Capt. J. C. Moulton	
H. Robinson, Esq.	
Hon. Mr. H. W. Firmstone	

PROCEEDINGS

OF THE

Annual General Meeting.

Minutes of the Annual General Meeting of the Straits Branch of the Royal Asiatic Society, held at the Society's rooms in the Raffles Museum, at 5 p.m. on Thursday, February 28th, 1918.

PRESENT: Hon. Mr. C. J. Saunders, President in the chair; The Bishop of Singapore (Dr. Ferguson Davie), H. E. Major Gen. Ridout, C.M.G., H. Robinson, Capt. J. C. Moulton, Rev. J. A. B. Cook, R. J. Bartlett, V. Knight, Hon. H. Marriott, R. M. Goldie, H. C. Robinson, Rev. J. S. Nagle, C. Boden-Kloss, Dr. v. Beuningen v. Helsingden, A. V. Brown, C. Bazell, Dr. R. Hanitsch, E. H. Myers, W. Makepeace, Rev. W. Murray and I. H. Burkill (Hon. Sec.).

The Minutes of the Annual General Meeting of February 27th, 1917 were taken as read, and confirmed.

The Annual Reports and Accounts were taken as read and were submitted for adoption.

Before they were passed Mr. H. C. Robinson called attention to the paragraph in the report referring to the Reports on the Robinson-Kloss expedition to Korinchi Peak, and said that the Council had not carried out their undertaking on the score of extra cost, and had subsequently earmarked \$2000 for the Library.

Mr. Boden-Kloss supported the objection to this proceeding.

Discussion followed, bearing on the proposed arrangement and the reasons for having to modify it.

The report and accounts were adopted and passed.

The Election of Officers for 1918 resulted as follows, Messrs. Bartlett and Murray acting as scrutineers.

Hon. Mr. C. J. Saunders	<i>President.</i>
Mr. W. George Maxwell, C.M.G.	<i>Vice President for Singapore.</i>
Hon. A. R. Adams	<i>Vice President for Penang.</i>
Hon. A. H. Lemon	<i>Vice President for F. M. S.</i>
Mr. W. Makepeace	<i>Hon. Secretary.</i>
Dr. R. Hanitsch	<i>Hon. Treasurer</i>
Mr. C. Bazell	<i>Hon. Librarian.</i>

The Election for members of Council resulted: —Hon. Mr. Hayes Marriott, Capt. J. C. Moulton, Mr. H. Robinson, the Hon. Mr. H. W. Firmstone.

Mr. W. Makepeace gave an address on Forty Years' Work of the Society.

The Chairman proposed and Capt. Moulton seconded:

That Rule 3 read.—

Members shall be of three kinds—Ordinary, Corresponding and Honorary.

That Rule 7 read.—

Distinguished persons, and persons who have rendered notable service to the Society may on the recommendation of the Council be elected Honorary Members by a majority at a General Meeting. Corresponding Members may, on the recommendation of two Members of the Council, be elected by a majority of the Council, in recognition of services rendered to any Scientific institution in British Malaya, or to Science generally in British Malaya. They shall pay no subscription; they shall enjoy the privileges of members except a vote at meetings, eligibility for office and free receipt of the Society's publications.

With a corresponding change in Rule 10 b, by the addition of the words "and corresponding" after the words "to elect Ordinary."

The hon. sec. explained the object of the alteration.

Mr. Boden-Kloss criticised it and suggested that it was not needed.

The alterations were adopted by thirteen votes to four.

The Chairman for the Council proposed that Mr. C. O. Blagden, Reader at the School of Oriental Studies, be elected an honorary member of the Society.

Mr. Boden-Kloss considered that honorary membership should be confined as a rule to those who had done active work for the Society in Singapore.

It was pointed out that Mr. Blagden had been Secretary to the Society, and that he had largely contributed to the Journal.

Mr. Blagden was unanimously elected a Honorary Member.

A vote of thanks to the Auditor, Mr. See Tiong Wah was carried.

A vote of thanks was accorded to Mr. Makepeace for his address.

A vote of thanks to the Chairman concluded the meeting.

Annual Report of the Straits Branch of the Royal Asiatic Society for 1917.

The active membership of the Society is estimated at 290.

The death in action of four further members has been ascertained since the last report was written—namely, Lieut.-Colonel V. A. Flower, Captain H. Millard, Mr. M. Thunder and Mr. R. B. Williams. Of Honorary Members, the loss of His Highness the late Rajah of Sarawak is regretted, and of members of the Hon. Tan Jiak Kim, C.M.G., Mr. J. C. Hermansen and Mr. G. C. Morant.

The Council has elected the following New Members:—

Dr. J. W. Adams.	Mr. E. P. Jones.
Mr. R. H. Adams.	Mr. V. V. Lemberger.
Mr. P. T. Allen.	Rev. J. S. Nagle.
Mr. G. P. Bradney.	Mr. R. Pears.
Mr. C. F. W. Clifford.	Mr. D. Y. Perkins.
Mr. R. Crichton.	Dr. M. Rattray.
Mr. G. E. S. Cubitt.	H. E. Maj.-Genl. D. H. Ridout, C.M.G.
Dr. G. A. Finlayson.	Mr. P. C. Russell.
Mr. G. B. Gloyne.	Mr. C. W. A. Sennett.
Mr. R. M. Goldie.	Mr. G. Shillitoe.
Mr. G. A. Hereford.	Mr. H. L. Sumner.
Mr. P. R. Hill.	Mr. W. L. Swan.
Dr. C. Hose.	Mr. G. R. Sykes.
Rev. Keppel Garnier.	Mr. M. B. Tenment.
Mr. D. James.	Mr. J. Watson.
Captain W. G. Yates.	

The personnel of the Council was changed during the year only by the resignation of Professor J. Argyll Campbell.

The Journal was published thrice—in April, August and December: and the year's volume, so made up, is of normal size. Its cost was about \$1,250, the bill of the last part not entering into the years' accounts.

In the report for the year 1915 it was mentioned that the Council had undertaken to publish the Reports on the Robinson-Kloss expedition to Korinchi Peak, Sumatra, as additional to the Journal. In the end, however, partly owing to the increased cost of paper, the Council has to content itself with handing to the authors the illustrations already prepared for the work, together with the balance of the £100 which had been granted by the Council.

The appeal in the last report for short papers for the Journal had an excellent effect, and the Journal contains 30 articles, which is many more than usual: four are on Malay history, seven on the language and literature, five on customs, one on art, one on ethnography, one on zoology, ten on botany, and one on the physiological difference in digestive power between Europeans, Chinese, Malays and Natives of India.

Mr. E. D. Merrill made to the Society an offer of his valuable Index to the Bornean Flora: but the Council feeling that other matter in sight for the Journal had a prior claim transmitted it with the author's consent to His Highness the Raja of Sarawak who will cause the index to be printed in the Sarawak Museum Journal.

For the purpose of illustrating an early Journal, photographs of the tombstones of Sultan Mansur have been procured from Malacca.

Some of the Malay texts published by the Society are being used in the higher schools of the Peninsula; and the Council felt justified in reducing the price at which they are sold.

The Library has received the usual exchanges.

The Hon. Treasurer's balance sheet shows \$4,700 invested, including \$2,200 in the Straits Settlements War Loan, and \$845.62 in current account.

I. HENRY BURKILL,

Hon. Secretary.

Singapore, 8th February, 1918.

STRAITS BRANCH ROYAL ASIATIC SOCIETY.

Receipts and Payments Account for the year ended 31st December, 1917.

Receipts.		\$	c.	\$	c.	Payments.		\$	c.	\$	c.
To Balance Brought forward from last Account:						By Printing Journal No. 70	..	130	84		
On Fixed Deposit: Mercantile Bank		2,500	—			do. " 74	..	229	—		
War Loan		2,200	—			do. " 75	..	288	08		
Current Account: Mercantile Bank		429	24			do. " 76	..	325	09		
do. : Chartered Bank		284	39			Books for Library	..	25	—		
				5,413	63	Bookbinding ..	..	113	50		
To Subscriptions:						Stationery ..	..	26	98		
For the year ended 31st Dec. 1913		5	—			Grant towards the Korinchi Expedition Report ..	..	510	74		
do. 1914		15	—			Salaries ..	..	227	33		
do. 1915		40	—			Postages and Pettyies ..	..	88	75		
do. 1916		90	—			Illustrations for Journal	..	286	25		
do. 1917		915	—							2,251	56
do. 1918		30	—			Balances carried forward:					
do. 1919		10	—			On Fixed Deposit: Mercantile Bank				2,500	—
1 Life Membership ..		50	—			War Loan ..	..			2,200	—
				1,155	—	(Current Account:					
To Sale of Journals				388	64	Mercantile Bank ..	..			561	23
" Sale of Maps ..				555	53	Chartered Bank ..	..			281	39
" Odd receipts ..				7	49						
" Bank Interest, Mercantile Bank											
and War Loan ..				276	89						
				7,797	18					7,797	18

Audited, vouchers and counterfoil receipts and F/D receipts seen and found correct.

SEE TIONG WAH.

January 15th 1918.

R. HANITSCH,
Hon. Treasurer,
January 12th, 1918.

A REVIEW

Of the Forty Years' Work of the Society.

An Address at the Annual General Meeting of Feb. 28th
1917.

BY WALTER MAKEPEACE.

In attempting to estimate the work done by the Society during these forty years reference has been made (1) to the minutes, which luckily have been regularly preserved, although extremely brief at times. Mr. Burkill the Secretary has compiled an index which was of great assistance: (2) the Index to Journals 1-50, compiled nine years ago by the late Mr. W. D. Barnes. A work awaiting some member is the index of the following numbers, which should follow the same plan, and if not published at once, should be ready for publication when No. 100 is issued: (3) The papers themselves as a criterion of the subjects dealt with and as assessing the zeal of the members in carrying out what is perhaps the most important function of the Society, namely the record of investigations of subjects connected with the Straits of Malacca and the neighbouring countries. By diligent study of the Journals issued new members are put in touch with what has already been done, have suggested to them lines of study and investigation, are saved much original research, become imbued with the spirit of the best of the past members, and will also, I am convinced, be filled with admiration at the industry of those who laid the foundations of the Society. The indices of the various numbers issued since No. 50 are useful for the same end as Mr. Barnes's index, with which they should be read.

The original Asiatic Society of Bengal was founded by Sir William Jones (1746-1794) a Puisne Judge, and the date of its foundation was Jan. 15th, 1784. The Centenary of the "Asiatick Society" was celebrated by the publication of a Centenary Review, a bulky volume Part I dealing with the History of the Society, Part II with Archaeology, History, Literature, etc., Part III with Natural Science. As the original society the A. S. of B. is our parent, I may quote these words from the founder's letter: "in the fluctuating imperfect and limited crudition of life such enquiries and improvements could only be made by the united efforts of many, who are not easily brought, without some pressing inducement or strong impulse, to converge into a common point.

The association of this Society with the A. S. of B. has been of a cordial nature. Dr. Wallich, who was in Singapore in 1822, had presented some botanical works to the Society. The earlier journals contain the following papers by men connected in early years with the Straits.

Raffles, Thomas—On the Malayan Nation (As. Res. XII, 102).

Farquhar, Major (died 1839)—An account of a new species of Tapir in the Malay Peninsula (As. Res. XIII, 417).

Logan, J. R.—Two papers on the Geology of Singapore (J. XVI, 667; J. XVI, 519).

Low, Col. J. (see references in Buckley's Anecdotal History)—The Geological Appearances and General Features of the Malay Peninsula, etc. (As. Res. XVIII, pt. 1, 128)—An account of several inscriptions found in Province Wellesley (J. XVII, pt. 2, 62)—An inscription from Kedah (J. XVIII, 247).

Marsden, W.—Traces of Hindu Literature and Language among the Malays (As. Res. IV, 221).

Newbold, Capt. J. W. T.—Eleven papers on Malayan Geography, J. II, 497; III, 601; IV, 241, 297, 537; V, 61, 257, 505, 561, 626, 670.

Our Members are entitled to attend the meetings of the A. S. of B. when in Calcutta, which right is reciprocated.

The Royal Asiatic Society of Great Britain and Ireland in London was founded in 1823, by Thomas Henry Colebrooke, who was president of the Asiatic Society of Bengal, 1806-16. The record of our own connection with the R. A. S. (London) is contained in our minutes, 1902. Mr. Ridley interviewed Dr. Rhys Davids, the Secretary, who expressed a desire for closer union with us, wished to exchange papers, and said that members of affiliated Societies could attend the meetings of the London Society and 'in other ways the parent Society would be willing to assist the Straits Branch.' Closer union was urged again in 1910. In 1912 our Society resolved that members of the R. A. S. of London be accorded the privileges of membership without election.

The Bombay Asiatic Society was founded in 1827, the Ceylon in 1845, the China Branch in 1858 and the Japan Branch in 1872. With all these we are in cordial correspondence and it might be well if members visiting the head-quarters of these Societies were to attempt to get into personal touch with them. The Empire of Knowledge knows no geographical boundaries.

The Straits Branch.

Turning to the history of the past forty years of our Society, the initial meeting was held on Nov. 4th, 1877, when it was resolved "that the gentlemen present form themselves into a Society

for collecting and recording scientific information in the Malay Peninsula and Archipelago." Possibly the meeting had not considered the "literary" branch of the Society, although with Mr. Hose, then Archdeacon, Mr. D. F. A. Hervey, Mr. W. E. Maxwell, and Mr. W. A. Petherick, the thought of this important branch of work must have been present on their minds.

The provisional committee met again on Jan. 21st 1878, and the draft rules having been agreed to, the first election of officers took place, and an Editorial Committee was chosen.

The Inaugural Address was delivered at the meeting of Feb. 28th 1878, at which meeting 35 members were elected. Also Mr. Miklucho-Maclay, a Russian traveller who had extensively explored the Malay Peninsula and the Coasts of New Guinea, was elected an Honorary Member of the Society. And Mr. Skinner exhibited a sketch map of the Peninsula, which was to occupy so much of the Society's energy in coming years.

Archdeacon Hose's inaugural address can be read in No. 1 of the *Journal*. Like all the addresses of the founder of the Society, it was markedly scholarly, and I would fain quote it at length, but time forbids. These points are striking: the praise he had for Mr. J. R. Logan, who for fifteen years edited 'The Journal of the Indian Archipelago' in Penang and was a first Vice-President in Penang; the hope he expressed that the resident families of the Straits, the Baumgartens, the Neuhommers, the Westerhouts would continue to add to the common knowledge; the stress he laid on the value of association in stimulating the accumulation and record of facts; his plans for the journal a six-monthly issue to begin with, as a chief instrument in the work of the Society; co-operation with the Raffles Library, which is to this day a valuable feature in the Society's work; the need for study of the developments of Islam among the races of this part of the world—the Society has not done too much in this respect; the field there is in the Malay language for study, in which he himself excelled; the development of the Native States then first associated with the Colony by the inauguration of the Residential System by Sir Andrew Clarke; the geography of the Peninsula, about which little was known; the map with immense spaces entirely blank, which was to play so important a part in the work of the Society.

The inaugural address was a great and useful stimulant and should be read by all our members keen on co-operating in the plans there set on foot.

Besides the inaugural address on Feb. 28th, 1878, Mr. A. M. Skinner, whose work in the Society was mainly geographical, introduced "The Map" which has been so useful to the public, so profitable to the Society, absorbing so much of its time. A paper which recalls the local controversy of a few years ago "Breeding Pearls of Borneo" was read by Dr. Dennys.

The Society met monthly. The earliest papers were "Chinese in Singapore," Mr. J. D. Vaughan; Malay Proverbs, Sir W. E. (then Mr.) Maxwell; "Notes on Gutta and Caoutchouc in the Malay Peninsula"—with no foreknowledge however of the *Hevea brasiliensis*; and a notice was issued as to the method of collecting vocabularies for comparison.

By May 6th, communication has been established with the Royal Asiatic Society of London, agreeing to exchange publications. The present full name of the Society was adopted. Languages were fairly recognised and a paper from the first honorary member, Mr. M. Maclay was entitled "The dialects of the Melanesian tribes in the Malay Peninsula." Three papers were read and four native gentlemen elected.

The first rules of the Society state that the objects of the Society shall be "(a) The Investigation of Subjects connected with the Straits of Malacca and the neighbouring Countries; (b) publication of papers in a journal; (c) formation of a library of books.

Rule 25 provides that "occasional popular lectures upon literary or scientific subjects may be delivered, under the sanction of the Council on evenings other than those appointed for General Meetings of the Society." This rule has never been put into operation, to the detriment of the educative value of the Society, I venture to think. A few years ago the Council declined to have an important public lecture on Malarial Mosquitoes by a Medical expert, delivered under its auspices; and still more recently on a proposal for popular lectures 1913-14, it was thought that they "cannot be arranged with success." The idea seemed to be that if lectures were popular, they could not be exact enough to satisfy the literary and scientific instincts of the Council, after a reply to a member "that the subject had not been lost sight of."

The Society was now in full swing. The first year's work was prodigious, and if similar energy has not been always shown during the 40 years of the Society there has never been a cessation of work, as a glance at the contents of the 51 numbers of the Journal, and especially No. 51—the index of the first fifty numbers—will show. A note should be kept of the completion of No. 100, in order that a second (or preferably complete index) may then be issued. Mr. Barnes, who compiled the index, made no attempt to compile a subject index but placed them under appropriate headings. These naturally fall into two classes, Physical and Literary, the former embracing natural history, philosophy, medicine, improvements of the Arts, and whatever is comprehended in the general term of physics. Subjects under the second head would be literature, philology, history, antiquities and ethnology—to which may be added recording knowledge for the use of future generations.

Very much has been done by members of the Society on the literary side. The Malay language and literature, such as it is, has been studied and recorded; Malay Customs and Amusements,

legends and traditions, and to some extent religion and superstition have been made the subject of papers. In bulk, this side of the Society's work looks well, but in the matter of religion there seems to have been a want of complete and accurate observation. As the first President observed "Nearly all Malays are Mohammedans and people seem to consider that when they have said that, they have said all that need be said on the subject." National policy not to interfere with the religion of the people in our Colonies; and the natural (or assumed) diffidence of the British to speak about religion and belief are no doubt responsible for what looks like a lost opportunity. "A man's religion is the chief fact with regard to him; a man's or a nation of men's." The main literary publications include four Hikayat, beginning with that of the famous Abdullah; four volumes of Miscellaneous papers relating to Indo-China, reprinted for the Society; a good many miscellaneous vocabularies; lists of place-names; disease-names; plant-names; Malay fairy tales, etc. Sir W. E. Maxwell's work in this respect stands easily first, and there are indications of fields yet to be worked and willing workers, but on the whole I diffidently suggest that the Literary side of the Society's work as judged by publications under its auspices has not come up to expectation. The author is a jealous father, disinclined to share with any one or any Society the honours of paternity.

On the physical side, the Society has had the inestimable benefit of the Government Specialists attached to the Forests and Museums as very active members. Mr. Ridley quite recently gave an address on the progress made by members of the Society in the different branches of physical research, and this address should be read as part of any record of forty years of the Society.

Let us now praise famous men. Forty years of a Society existing under circumstances such as ours is the equivalent of four generations. I think the oldest member of the Society now in Singapore is Mr. Seah Liang Seah, elected in 1888. Dr. Shellabear came in in 1894 and we may hope that he will be able to return to the Colony. The activities of Mr. C. J. Saunders began in 1896, so that your Chairman has passed his majority, and but for the fact that he is present I would speak of his constant interest in the Society and regular attendance at the Council meetings as an exemplar.

The father of the Society is indubitably Bishop Hose, whose portrait hangs in this room, and whose memory is ever-green. It was to him that the Society owed its inception and much of its vigour for the thirty years during which he occupied the office of President, almost without a break, till the actual day of his retirement in 1908, after forty years service in the Straits.

In 1890 two well-known members of the Society were elected, Messrs. H. N. Ridley, Mr. C. O. Blagden; the late Mr. Arthur Knight joined in 1888. He brought to the Council that long and

useful service at once a source of inspiration and of help in carrying on what may be called the machinery of the Society. Mr. Ridley came at a very critical time, in 1890. He took up the Honorary Secretaryship in the same year and if Bishop Hose was the main-spring of the Society, Mr. Ridley was certainly the escapement, and with his colleague Dr. Hanitsch, still our honorary treasurer, has kept us going to this day. Many useful contributions to the Journal have come in from Scientists of "the neighbouring countries"—Saratrak, especially, but of late years the multiplication of departmental journals, while no doubt gratifying to the editors and writers, has diffused energy and made much useful knowledge less accessible than it would be if published in a Journal with editions of 500, to which the Journal of the R. A. S. (Straits Branch) has now attained. If all the writings of all the savants were concentrated, the issue of our Journal could be made regular, of fair dimensions, and of more general interest. With the passing of the Map, the Journal becomes increasingly important to the Society, and more and more valuable as a record.

This subject of "record" brings me to a matter which was last under consideration in 1914—the forming of a collection of photographic records. Nothing has yet been done in this respect. Many of our members must have prints and negatives of interest in our brief-lived community. The questions of permanency of interest and of the record are not easily solved but to my mind a useful field lies open to the Society, and a small Photographic Records committee of members skilled in the "dark" art could probably devise a means of making the Society's Library a valuable and permanent record of the times and useful to the generations that come after us.

Time does not permit me to deal with any history of the financial or other machinery of the Society. And my own conviction is that no *good* organisation in the Straits languishes for lack of funds as long as its members are keen. We have had "downs"—as when Mr. Ridley took charge, and "ups" as when Dr. Galloway secured a large number of new members some few years ago. Our chief income, now that the Map has passed into other hands, professional hands, must be Members Subscriptions, and a careful eye must be kept on the list, so that losses by retirement on departure from the Colony may be made good by new additions. The life of the Society depends, however, upon the spirit which animates its members. The practice of permitting new members to purchase back copies of the Journal at a very small price would not only convert locked-up capital into liquid assets, but would stimulate the interest of new comers, inform them somewhat of what has been done in the past, indicate directions in which their work for the Society might lie, and secure members to carry on the ideals of the founders and early members of the Society, which may be lost sight of with a comfortable bank balance and an efficient working machine. The Society, I conceive it, will be judged not by the machinery, but by the results. One wants to concentrate all scien-

title and literary study, and if the medical, scientific planting and mining, industrial, literary and philosophic interests of Matava could be concentrated in the Society, a decade would be sufficient to make its foundations more secure than ever. Its functions may be summed up: to investigate, to record,—and record is a useful step to further investigation—to collect knowledge, not only among its members but from all earnest inquirers and workers.



List of Members for 1918.

*Life Members. †Honorary Members.

Patron His Excellency SIR ARTHUR YOUNG, G.C.M.G., Governor of
the Straits Settlements and High Commissioner for
the Malay States.

Date of election.

- | | |
|-----------------|--|
| 18 Jan., 1903. | ABBOTT, Dr. W. L., 400, South 15th Street, Philadelphia, U. S. A. |
| 21 Sept., 1916. | ABRAHAM, H. C., Survey Dept., Kuala Lumpur. |
| 24 June, 1909. | ADAM, Frank. The Straits Trading Co., Singapore. |
| — 1907. | ADAMS, Lieut.-Col., the Hon. A. R., Messrs. Adams and Allan, Penang. [Vice-President, 1910: 1917]. |
| 14 Dec., 1910. | ADAMS, H. A., Sadong, Sarawak. |
| 20 June, 1910. | ADAMS, H. Powys, Imber Cross, Thames Ditton, Surrey, England. |
| 22 March, 1917. | ADAMS, Dr. J. W., Moulmein Road Hospital, Singapore. |
| 22 March, 1917. | ADAMS, R. H., c/o Messrs. Topham, Jones and Railton, Ltd., Singapore. |
| 10 March, 1909. | ADAMS, T. S., District Officer, Kuala Krai, Kelantan. |
| 7 Feb., 1910. | ALDWORTH, J. R. O., Kuala Lumpur. |
| 17 Feb., 1913. | ALLEN, Rev. George Dexter, Singapore. |
| 3 May, 1914. | ALLEN, H. C. W., c/o Messrs. Boustead & Co., Singapore. |
| 22 March, 1917. | ALLEN, P. T., Chinese Protectorate, Singapore. |
| 16 Feb., 1914. | AMERY, Rev. A. J., Victoria Bridge School, Singapore. |
| — 1907. | ANDERSON, E., Messrs. Mansfield and Co., Singapore. |
| 12 Oct., 1911. | ARMSTRONG, W. R., L.L.D., D.C.L., Messrs. Logan and Ross, Penang. |
| 27 Oct., 1908. | ARTHUR, J. S. W., Assistant Adviser, Kedah. |
| 4 June, 1908. | *AYRE, C. F. C., High School, Malacca. |
| 3 May, 1915. | BADDELEY, F. M., Postmaster General, Singapore. |
| 1 Feb., 1915. | BAIN, Norman K., Kuala Langkat. |
| 20 May, 1912. | BAKER, A. C., c/o W. Evans, Esq: The Limes, Crowmarsh near Wallingford, Berks, England, (Hon. Librarian, 1912-1913). |

- 28 Nov., 1916. BANKS, H. H., Sanitary Board, Seremban.
- 10 Jan., 1899. *BANKS, J. E., c/o the American Bridge Co., Ambbridge, Pa., U. S. A.
- 23 June, 1904. BARTLETT, R. J., Inspector of Schools, Singapore.
- 24 May, 1910. BARTLEY, W., Civil Service, Singapore.
- 20 July, 1911. BAZELL, C., Vade & Co., Singapore. (Hon. Librarian, 1916—17).
- 24 June, 1909. BEAN, A. W., c/o Messrs. Robinson & Co., Singapore.
- 16 June, 1913. BILL, V. G., Forest Department, Kuala Lumpur.
- 25 Feb., 1910. *BERKLEY, H. F. M. S. Civil Service.
- 14 Aug., 1912. BICKNELL, J. W., c/o General Rubber Co., Medan, Sumatra.
- 1885. BICKNELL, W. A., 37, Milton Avenue, Well-way, Bath, England.
- 4 June, 1908. *BISHOP, Major C. F., R. A.
- 27 Jan., 1890. *BLAGDEN, C. O., India Office Library, Whitehall, London, S. W., (Hon. Secretary, 1896).
- 13 Feb., 1917. BLAIR, R. H. Balfour, Tazil Estate, Malacca.
- 1884. BLAND, R. N., c.m.g., Broadfields, Letchworth, Herts, England. (Council, 1898-1900; Vice-President, 1907—1909).
- 14 Dec., 1910. BOULT, F. F., Bintulu, Sarawak.
- 16 Aug., 1915. BOYD-WALKER, J. W., Atbara Estate, Kuantan, Pahang.
- 13 Jan., 1913. BRADDILL, R. St. J., Messrs. Braddell Bros., Singapore.
- 12 Feb., 1918. BRADNEY, G. P., Audit Office, Singapore.
- 23 Sept., 1897. BROCKMAN, Sir Edward L., K.C.M.G., Kuala Lumpur.
- 1 April, 1910. BROOKE, J. R., Government Monopolies Department, Keppel Harbour, Singapore.
- 13 Jan., 1909. BROOKS, C. J., Lebong Tandai, Benkoelen, Sumatra.
- 8 Sept., 1909. BROWN, A. V., Civil Service, Singapore.
- 16 Aug., 1915. BROWN, C. C., F. M. S. Civil Service, Kuala Lumpur.
- 27 Jan., 1910. BROWN, D. A. M., Messrs. Brown, Phillips and Stewart, Penang.
- 1 Dec., 1913. *BRYAN, J. M., Kuching, Sarawak.
- 26 March, 1887. BRYANT, A. T., (Council, 1907: 1910: Vice-President, 1912, 1914-1916). England.
- 28 Oct., 1912. BURKILL, J. H., Botanic Gardens, Singapore. (Council, 1913: Hon. Secretary, 1914-1917).
- 29 Sept., 1913. *CALDECOTT, Andrew, Secretariat, Kuala Lumpur.

- 16 Jan., 1916. CAMPBELL, Professor J. Argyll, M.D., D.Sc.
Medical School, Singapore (Council, 1917).
- 16 Feb., 1914. CARRER, Capt. G. E., 4th Devon, Heyford House,
Cullompton, Devon, England.
- 3 Jan., 1909. CARVER, C. L., Messrs. Donaldson and Burkin-
shaw, Singapore.
- 27 Jan., 1910. CHANCELLOR, Hon. Capt. A. R., Police Office,
Singapore.
- 15 Jan., 1906. CHAPMAN, W. T., Ipoh, Perak.
- 1 Dec., 1913. *CHOO KIA PENG, Kuala Lumpur.
- 16 March, 1911. CLAYTON, T. W., Temerloh, Pahang.
- 2 Feb., 1911. CLEMENT, W. R. T., Sarawak.
- 22 March, 1917. CLIFFORD, G. F. W., Juasseh, Negri Sembilan.
- 13 Jan., 1913. CHULAN, Raja, bin Ex-Sultan Abdullah, Kuala
Kangsar, Perak.
- 30 Jan., 1894. COLLYER, W. R., I. S. O., Hackford Hall, Reep-
ham, Norfolk, England. (Council 1904: Vice
President, 1897-1900, 1902, 1904-1905; Hon.
Member, 1906).
- 1 March, 1897. *CONLAY, W. L., Kuala Lumpur.
- 27 Jan., 1899. COOK, Rev. J. A. B., Gilstead, Singapore.
- 1910. COOK, Hon. W. Wallace, c/o The Straits Trading
Co., Singapore.
- 22 March, 1917. CRICHTON, R., The Secretariat, Singapore.
- 13 Feb., 1917. CROSS, Rev. W., Cavanagh Road, Singapore.
- 14 Aug., 1912. CROSSLER, Frank J., Ulu Kesial Estate, Kelantan.
- 27 Jan., 1910. CROUCHER, Dr. F. B., General Hospital, Singa-
pore.
- 22 March, 1917. CUBITT, G. E. S., Conservator of Forests, S. S.
and F. M. S., Kuala Lumpur.
- 24 May, 1910. DALY, M. D., Batu Gajah, Perak.
- 27 Jan., 1910. DARBISHIRE, Hon. C. W., c/o Messrs. Paterson,
Simons & Co., Singapore.
- 1907. DENT, Dr. F., Government Analyst, Singapore.
- 5 Nov., 1903. *DESHON, H. F., Southfield, Combe Down, Bath,
England.
- 23 Sept., 1897. DICKSON, E. A., 26, Randolph Crescent, Maida
Hill, London.
- 28 July, 1905. DOUGLAS, Hon. R. S., Baram, Sarawak.
- 30 Nov., 1914. DUNCAN, W. Wallace, Assistant Censor, General
Post Office, Penang.
- 27 Jan., 1910. DUNMAN, W., Grove Estate, Tanjong Katong,
Singapore.
- 16 Aug., 1915. *DRSSEK, O. T., Malay College, Malacca.
- 13 Oct., 1899. EDMONDS, R. C., F.M.S. Civil Service, Seremban.

- 1885. ELLERTON, His Excellency Sir W., K.C.M.G., Renby Grange, Boarshend, near Thimbridge Wells, England.
- 27 Jan., 1910. ELLERTON, H. B., F. M. S. Civil Service, Kuala Kangsar, Perak.
- 3 June, 1909. ELLIS, Sir Evelyn C., Messrs. Drew and Napier, Singapore.
- 16 Jan., 1916. ELLIS, J. W., Curdell, P. M. S. Civil Service, Kuala Lumpur.
- 27 Jan., 1910. ENGLISH, L., Netherlands Trading Society, Batavia.
- 25 March, 1913. ERMIN, C., Kuching, Sarawak.
- 27 Jan., 1910. EVANS, W., The Limes, Crownmarsh near Wallingford, Berks, England.
- 7 Feb., 1910. FAIRSHAW, Dr. P. S., Government Veterinary Department, Singapore.
- 8 Sept., 1909. FARRER, R. J., Kota Bharu, Kelantan.
- 26 Jan., 1911. *FERGUSON-DAVIE, Rt. Rev. Dr. C. J., Bishop of Singapore (Council, 1912-1913).
- 8 Sept., 1909. FERRIER, J. G., c/o Borneo Company, Soerabaya, Java.
- 22 March, 1911. FINLAYSON, Dr. G. A., Singapore.
- 24 May, 1910. FIRMSSTONE, H. W., Education Department, Singapore.
- 12 Jan., 1900. FLEMING, T. C., Larut, Taiping, Perak.
- 2 Sept., 1897. *FLOWER, Major S. S., Zoological Gardens, Ghizeh, Egypt.
- 16 Jan., 1916. FORD, H. W., Municipal Offices, Malacca.
- 19 Aug., 1908. FRIEDMAN, D. G., Court of Justice, Kuala Lumpur.
- 27 Jan., 1910. *FROST, MEADOWS, S. S. Civil Service.
- 14 Aug., 1912. GALLAGHER, W. J., General Rubber Co., Medan Sumatra.
- 23 Jan., 1903. †GALLOWAY, Dr. D. J., British Dispensary, Singapore. (Vice-President, 1906—1907; President, 1908—1913; Hon. Member, 1917).
- 26 Oct., 1917. GARNIER, Rev. Keppel, Penang.
- 26 May, 1897. *GERENJ, Lt.-Col. G. E.
- 8 Sept., 1903. GIPSON, W. S., High Court, Kedah.
- 28 May, 1902. *GIMLETTE, Dr. J. D., 5, Merton Road, Southsea, England.
- 4 Jan., 1916. GLENNIE, Dr. J. A. R., Municipal Offices, Singapore.
- 12 Feb., 1918. GLOYNE, G. B., Samarang, Java.
- GOLDIE, R. M., Vade & Co., Singapore.
- 21 Sept., 1916. GOODMAN, A. M., Penang.
- 18 March, 1909. GOULDING, R. R., Survey Department, Kuala Lumpur.

- 27 Jan., 1910. GRAY, N. T., Taiping, Perak.
- 18 April, 1918. GREENE, Dr. D. L., Kuching, Sarawak.
- 14 Sept., 1911. GRIFFITHS, J., Superintendent of Surveys, Johore Bahru.
- 13 Jan., 1916. GUPTA, SHIVA PRASAD, Nandansahu Street, Benares City, United Provinces, India.
- 12 — 1886. HALL, A., Dachurst, Hildenborough, Kent, England.
- 15 July, 1907. HALL, G. A., Alor Star, Kedah.
- 5 May, 1914. HALL, J. D., Batu Pahat, Johore.
- 26 Jan., 1911. HALLIFAX, F. J., Municipal Offices, Singapore.
- 12 April, 1915. HAMILTON, A. W. H., Central Police Office, Penang.
- 16 March, 1911. HENDY, Dr. J. M., St. Mary's Dispensary, 75, Hill Street, Singapore.
- 11 Sept., 1895. HANFSCHE, Dr. R., Raffles Museum, Singapore. (Council, 1897, 1907-1909; Hon. Treasurer, 1898-1906, 1910-1911, 1914-1916; Hon. Secretary, 1912-1913).
- 3 June, 1909. HARRINGTON, A. G., Municipal Offices, Singapore.
- 5 Jan., 1904. *HAYNES, A. S., Tampin, Negri Sembilan.
- 24 June, 1909. HENNING, W. G., c/o Messrs. Mansfield & Co., Singapore.
- 26 Oct., 1917. HERFORD, G. A., Province Wellesley.
- 6 June, 1910. HERMAN, E. D., c/o Messrs. Boustead & Co., Singapore.
- 1878. HILL, F. C., The Manor House, Normandy near Guildford, England.
- 12 Feb., 1918. HILL, P. R., Eyatt & Co., Singapore.
- 12 Oct., 1911. HOOD-BEECH, Hon. A., c/o Messrs. Guthrie & Co., 5, Whittington Avenue, London, E. C.
- 26 Oct., 1917. HOSE, Dr. C., Britannia House, Hunstanton, Norfolk, England.
- 22 Nov., 1897. HOSE, E. S., Telok Anson.
- A founder, 1878. HOSK, Rt. Rev. Bishop G. F., Wake Vicarage, Normandy near Guildford, England. (Vice-President, 1890-1892; President, 1894-1907).
- 7 Oct., 1891. HOYCK VAN PANDERENT, P. C., 7, Sweelinckstraat, The Hague, Holland.
- 20 Oct., 1909. HUBBARD, T. R., Pertang, Jelebu, Negri Sembilan.
- 20 Oct., 1909. HUGHES, J. W. W., Temerloh, Pahang.
- 15 July, 1907. HUMPHREYS, J. L., Trengganu.
- 27 Jan., 1910. JACKSON, Col. H. M., c/o the Survey Department, Kuala Lumpur.

- 21 Sept., 1916. JAMES, Hon. F. S., C.M.G., Colonial Secretary, Singapore.
- 12 Feb., 1918. JAMES, Dr. Banjermasin, Dutch Borneo.
- 27 Jan., 1910. JAMISON, Dr. T. Hill, 1, Bishop Street, Penang.
- 26 March, 1907. JANION, E. M., c/o English, Scottish and Australian Bank, 38, Lombard St., London, E. C.
- 1 Dec., 1911. JELL, A. S., Ipoh, Perak.
- 1910. JOHNSON, B. G. H., Telok Anson.
- 15 June, 1911. JOHNSON, Hon. H. S. B., Limbang, via Labuan.
- 12 Feb., 1918. JONES, E. P., Fleet Paymaster, Fort Canning, Singapore.
- 27 Jan., 1910. JONES, H. W., Kuantap, Pahang.
- 17 Feb., 1913. JONES, S. W., Pekan, Pahang.
- 26 May, 1912. JONES, Wyndham, Miri, Sarawak.
- 16 April, 1912. JONES, W. R.
- 21 Sept., 1916. KAMARALZAMAN, Raja, bin Raja Mansur, Tapah, Perak.
- 20 Oct., 1909. KLITH, Dr. R. D., England. (Council, 1911-1912, 1914-1916).
- 10 Feb., 1916. KILLAGHER, G. B., S. S. Civil Service, Singapore.
- 3 June, 1909. KIMP, W. Lowther, c/o Messrs. F. W. Barker and Co., Singapore.
- 13 Jan., 1913. KEMPE, John Erskine, Kuala Lumpur.
- 23 May, 1906. KINSEY, W. E., Forest House, Seremban.
- 27 Jan., 1910. KIEK, Dr. J., Perang.
- 29 Jan., 1900. KLOSS, C. Boden, The Museum, Kuala Lumpur. (Council, 1901-1908).
- 12 April, 1915. KNIGHT, Valentine, Raffles Museum, Singapore.
- 31 Jan., 1902. LAIDLAW, G. M., Pekan, Pahang.
- 16 Feb., 1914. LAMBOURNE, J., Castleton Estate, Telok Anson, Perak.
- 5 May, 1914. LAVILLER, L. V. T., Balik Pulau, Penang.
- 28 May, 1902. †LAWES, Rev. W. G., Port Moresby, New Guinea.
- 5 Oct., 1906. LAWRENCE, A. E., Kuching, Sarawak.
- 29 Sept., 1913. LEICHTER, Dr. W. S., Pekan, Pahang.
- 22 March, 1917. LEMBERGER, V. V., c/o United Engineers, Ltd., Singapore.
- 28 March, 1891. *LEXON, Hon. A. H., Seremban. (Vice-President, 1916-17).
- 30 May, 1890. LEWIS, J. E. A., B. A., 698, Harada Mura, Kobe, Japan.
- 16 Aug., 1915. LEWTON-BRAIN, L., Director of Agriculture, Kuala Lumpur.
- 20 May, 1897. LIM BOON KENG, Hon. Dr. M.D., c/o The Dispensary, Singapore.

- 12 April, 1915. LIM CHENG LAW, Millview, Penang.
- 16 Feb., 1914. LORNE, J., Land Office, Singapore.
- 8 June, 1909. LOW, H. A., c/o Messrs. Adamson, Gilfillan and Co., Penang.
- 27 Jan., 1910. LUFTON, Harry, Bukit Mertajam, Province Wellesley.
- 26 June, 1907. LYONS, Rev. E. S., 82, Isla de Romero, Manila.
- 3 June, 1909. MCARTHUR, M. S. H., Kuala Lumpur.
- 23 Sept., 1897. McCausland, C. F., Port Dickson.
- 25 Feb., 1910. *MACFADYEN, Eric, Kuala Lumpur, Selangor.
- 24 July, 1908. MACKRAY, W. H., Kuala Lumpur.
- 1 April, 1910. MACLEAN, L., Kuala Lumpur.
- 21 April, 1904. MAHOMED, Hon. Datoh, bin Mahbob, Johore Bahru, Johore.
- 8 Sept., 1903. MAKEPEACE, W., c/o Singapore Free Press, Singapore. (Council, 1914-1916: Hon. Librarian, 1910-1912: Hon. Treasurer, 1909: Vice-President, 1917).
- 15 April, 1908. MAIN, T. W., Cheng Estate, Malacca.
- 10 Feb., 1916. MAXX, W. E., Hotel Pavillon, Samarang, Java.
- 12 Feb., 1902. MARRIOTT, Hon. H., The Treasury, Singapore. (Council, 1907-1908, 1910-1913, 1915-1917).
- 24 June, 1909. MARSH, F. E., Municipal Offices, Singapore.
- 12 May, 1909. MARSHALL, Harold B., Bintang Estates, c/o Messrs. F. W. Barker & Co., Singapore.
- 15 July, 1907. *MARRINER, J. T., Kuantan, Pahang.
- 5 May, 1914. MARTIN, T. A., c/o Messrs. Kennedy and Co., Penang.
- 5 Nov., 1903. MAXWELL, W. George, c.m.g., Singapore. (Council, 1905, 1915: Vice-President, 1916).
- 16 Dec., 1909. MAY, C. G., Deputy Colonial Engineer, Penang.
- 16 Feb., 1914. MEAD, J. P.
- 7 Feb., 1910. MILLER, T. C. B., Fairlie, Nassim Road, Singapore.
- 29 Sept., 1913. MOLLETT, H. B., Tirol P. O., Negri Sembilan.
- 8 Sept., 1909. *MOULTON, Capt. J. C., Fort Canning, Singapore.
- 11 Oct., 1915. *MUNDELL, H. D., c/o Messrs. Sisson and Delay, Singapore.
- 15 June, 1911. MUNRO, R. W., Morib, Selangor.
- 17 Feb., 1913. MURRAY, Rev. W., M.A., 1, Gilstead Road, Singapore.
- 10 Feb., 1916. MYERS, Frank H., Asiatic Petroleum Co., Singapore.
- 22 March, 1917. NAGLE, Rev. J. S., M.A., Principal, Anglo-Chinese School, Singapore.

- 8 Sept., 1909. NATHAN, J. E., Raub, Pahang.
 25 Feb., 1910. NIVEN, W. G., 11, Derby Crescent, Kelvinside, Glasgow, Great Britain.
 9 May, 1900. NORMAN, Henry, Kelantan.
 5 Jan., 1906. NUNN, B., Malacca.
 26 Jan., 1911. O'MAY, J., Kuala Kangsar, Perak.
 10 Feb., 1916. ONG BOON TAI, 29, South Canal Street, Singapore.
 17 Feb., 1913. OVERBECK, H., Trial Bay, N. S. W., Australia.
 2 Feb., 1911. PANYAKUN Samahut, The Royal State Railways Dept. Standard Gauge, 196, Huang Road, Bangkok, Siam.
 27 Oct., 1908. PARR, The Hon. C. W. C., Residency, Kuala Lipis, Pahang.
 20 Oct., 1909. PLACOCK, W., England.
 22 March, 1917. PLAYS, R., c/o Messrs. F. W. Barker & Co., Singapore.
 4 Jan., 1910. PIERCE, R.
 5 May, 1911. PREPYS, W. E., Pasir Puteh, Kelantan.
 — 1878. †PRIDHAM, the Ven. Archdeacon J., Chard, Somerset, England.
 26 Oct., 1917. PERKINS, D. Y., Drew and Napier, Singapore.
 25 Feb., 1910. PRATT, Capt. E., Ysrad, Plymstock, Devon, England.
 22 Jan., 1912. PRICE, William Robert, B.A., F.R.S., Pen Moel, Chepstow, England.
 22 March, 1906. PRINGLI, R. D., The Y. M. C. A. Head quarters, London.
 5 Oct., 1906. PYKETT, Rev. G. F., M. E. Mission, Kuala Lumpur.
 3 May, 1915. RAGGI, J. G., Phlab Phla Jai Road, Bangkok, Siam.
 21 Aug., 1917. RATIRAY, Dr. M., 10, Riverside, Malacca.
 10 Feb., 1916. RAYMAN, L., Assistant District Officer, Kuala Lumpur.
 27 Jan., 1910. *REID, Dr Alfred, Parit Buntar.
 27 Jan., 1910. REID, Alex., c/o Messrs. McAlister and Co., Singapore.
 20 Oct., 1909. RICHARD, D. S.
 15 June, 1911. RICHARDS, R. M., The Calcedonia Estate, Province Wellesley.
 18 April, 1918. RICHIE, C., The Sagga Rubber Estate, Siliu, F. M. S.
 27 Jan., 1890. †RIDLEY, H. N., C.M.G., F.R.S., 7, Cumberland Road, Kew Gardens, Surrey, England.

- (Council, 1894-1895: Hon. Secretary, 1890-1893, 1897-1911: Hon. Member, 1912).
- 26 Oct., 1917. RIDOUT, H. E. Major-General D. H., C.M.G., General Officer Commanding, S. S.
- 14 Sept., 1911. ROBERTSON, G. H. M.
- 11 Aug., 1912. ROBERTSON, J., c/o Messrs. Guthrie and Co., Singapore.
- 16 March, 1911. ROBINSON, H., c/o Messrs. Swan and Maclaren, Singapore. (Council, 1916-17).
- 17 March, 1904. ROBINSON, H. C., The Museum, Kuala Lumpur. (Vice-President, 1909: 1913).
- 10 Feb., 1916. ROGERS, A., Public Works Department, Singapore.
- 22 Jan., 1896. ROSTADOS, E., Gali Rubber Estate, Raub, Pahang. (Council, 1901).
- 1 March, 1897. ROWLAND, W. R.
- 12 Feb., 1918. RUSSELL, P. C., Swan and Maclaren, Singapore.
- 7 April, 1909. SANDERSON, Mrs. R.
- 10 Feb., 1916. SARAWAK, His Highness The Raja of, Kuching, Sarawak.
- 1885. SATOW, Sir Ernest M., Beaumont, Ottery St. Mary, Devon, England.
- 22 Jan., 1896. SAUNDERS, Hon. C. J., Official Assignee, Singapore. (Vice-President, 1910-1911, 1914-1915: President, 1916).
- 17 March, 1904. SCHWABE, E. M., Cheras Estate, Kajang, Selangor.
- 27 Jan., 1910. SCOTT, R., District Court, Singapore.
- 5 Oct., 1906. SCRIVENOR, J. B., Batu Gajah, Perak.
- 26 March, 1888. SEAH LIANG SEAH, c/o Chop Chin Hin, Singapore.
- 12 April, 1915. SEE TIONG WAH, c/o Hongkong and Shanghai Bank, Singapore.
- 12 Feb., 1918. SEXTON, C. W. A., War Trade Office, Singapore.
- 30 Jan., 1894. SHILLI PEAR, Rev. Dr. W. G., D.D., c/o Board of Foreign Missions, 150, Fifth Avenue, New York City, U. S. A. (Council, 1896-1901, 1904: Vice-President, 1913: President, 1914-1915).
- 3 June, 1909. SIMS, W. A., c/o Commercial Union Assurance Co., Singapore.
- 22 March, 1917. SHILLIFFOR, G., Kuantan, Pahang.
- 20 May, 1912. SMITH, Prof. Harrison W., Massachusetts Institution of Technology, Boston, Mass., U.S.A.
- 27 Jan., 1910. SONG ONG SIANG, c/o Messrs. Aitken and Ong Siang, Singapore.

- 27 Jan., 1910. SPARKER, H., Netherlands Embassy, New York, U. S. A.
- 10 Nov., 1909. STEADMAN, V., c o Messrs. Swan and Maclaren, 5, Raffles Place, Singapore.
- 24 May, 1910. STEEDMAN, R. S., Duff Development Co., Ltd., Kuala Tui, Kelantan.
- 27 Jan., 1910. STILL, A. W., c o Straits Times, Singapore. (Council, 1914-1915).
- 13 Feb., 1917. STIRLING, W. G., Government Monopolies Department, Malacca.
- 3 May, 1915. STRICKLAND, Dr. C., Sungei Seput, Perak.
- 14 Sept., 1911. STUART, E. A. G., Alor Star, Kedah.
- 24 May, 1910. STURROCK, A. J., Batu Gajah, Perak.
- 22 March, 1917. SUMNER, H. L., Inspector of Schools, Taiping, Perak.
- 26 Oct., 1917. SWAN, W. L., Pondok Tanjong, Perak.
- 22 Jan., 1912. SWAYNE, J. C., Kuching, Sarawak.
- 12 Feb., 1918. SYKES, G. R., Import and Export Office, Singapore.
- 4 June, 1908. TAN CHENG LOCK, 59, Heeren Street, Malacca.
- 16 June, 1913. TAYLOR, Lt. Clarence J., King's Own Yorkshire Light Infantry, 48th Street, Basrah, Mesopotamia.
- 26 Oct., 1917. TENNENT, M. B., Ehot Vale House, Blackheath, London.
- 14 Aug., 1914. TRACY, F. D., c o The Standard Oil Co., Penang.
- 18 April, 1918. VALPY, G. C., Official Assignee Office, Singapore.
- 14 Aug., 1887. VAN BEUNINGEN VAN HELSDINGEN, Dr. R., 484 2, Bukit Timah Road, Singapore. (Hon. Librarian, 1914-1915).
- 3 June, 1909. WARD, Hon. A. B., Kuching, Sarawak.
- 10 Feb., 1916. WATKINS, Mrs. Legrew, c o Messrs. Watkins & Co., Singapore.
- 21 Aug., 1917. WATSON, J., Kuala Lipis.
- 13 Jan., 1916. WARSON, J. G., Forest Department, Kuala Lumpur.
- 18 Oct., 1916. WARSON, Dr. Malcolm, Klang, Selangor.
- 27 Jan., 1910. WELD, F. J., The Residency, Pahang.
- 15 July, 1907. WELHAM, H., c o The Straits Echo, Penang.
- 27 Jan., 1910. WHITEHEAD, C. B., Police Office, Butterworth, Province Wellesley.
- 28 Oct., 1912. WILLIAMS, F., Rose Cottage, St. Agnes, Cornwall, England.
- 27 Jan., 1910. WILLIAMS, S. G., Municipal Offices, Singapore.
- 27 Jan., 1910. *WINKELMANN, H., Malacca Street, Singapore.

- 24 Nov., 1904. WINSTEDT, R. O., Kuala Lumpur.
- 25 Feb., 1910. WOLFERSTAN, L. E. P., The Residency, Malacca.
- 28 May, 1902. WOLFE, E. C. H., The Secretariat, Singapore.
- 4 June, 1908. *WOOD, E. G., Taiping, Perak.
- 16 June, 1913. WOOD, W. L., The Selborne Plantation Co., Reserve Estate, Snukai, Perak.
- 21 Sept., 1916. WOOLLITT, G. F. C., Klagaw, Labuk and Sugut District, B. N. B.
- 14 Sept., 1911. WORSLEY-TAYLOR, F. E., c/o Messrs. Vade and Co., Singapore.
- 12 April, 1915. *WORTHINGTON, A. F., Kuantan, Pahang.
- 5 May, 1914. WYLEY, A. J., Lebong Tandai, Benkoelen, Sumatra.
- 26 Oct., 1917. YATES, Capt. W. G., West Kent Regiment, Tanglin Barracks, Singapore.
- 26 April, 1916. YOUNG, E. Stuart, Kinarut Estate, via Jesselton, B. N. B.
- 24 Nov., 1904. *YOUNG, H. S., Bau, Sarawak.

RULES
of the Straits Branch
of the
Royal Asiatic Society.

I. Name and Objects.

1. The name of the Society shall be 'The Straits Branch of the Royal Asiatic Society.'

2. The objects of the Society shall be:—

(a) The increase and diffusion of knowledge concerning British Malaya and the neighbouring countries.

(b) the publication of a Journal and of works and maps.

(c) the formation of a library of books and maps.

II. Membership.

3. Members shall be of three kinds—Ordinary, Corresponding and Honorary.

4. Candidates for ordinary membership shall be proposed and seconded by members and elected by a majority of the Council.

5. Ordinary members shall pay an annual subscription of \$5 payable in advance on the first of January in each year. Members shall be allowed to compound for life membership by a payment of \$50.

6. On or about the 30th of June in each year the Honorary Treasurer shall prepare and submit to the Council a list of those members whose subscriptions for the current year remain unpaid. Such members shall be deemed to be suspended from membership until their subscriptions have been paid, and in default of payment within two years shall be deemed to have resigned their membership.

No member shall receive a copy of the Journal or other publications of the Society until his subscription for the current year has been paid.

7. Distinguished persons, and persons who have rendered notable service to the Society may on the recommendation of the

Council be elected Honorary members by a majority at a General meeting. Corresponding Members may, on the recommendation of two Members of the Council, be elected by a majority of the Council; in recognition of Services rendered to any Scientific institution in British Malaya. They shall pay no subscription: they shall enjoy the privileges of members except a vote at meetings, eligibility for office and free receipt of the Society's publications.

III. Officers.

8. The officers of the Society shall be:—

A President.

Three Vice Presidents, resident in Singapore, Penang and the Federated Malay States respectively.

An Honorary Treasurer

An Honorary Librarian.

An Honorary Secretary.

Four Councillors.

These officers shall be elected for one year at the annual General Meeting, and shall hold office until their successors are appointed.

9. Vacancies in the above offices occurring during any year shall be filled by a vote of majority of the remaining officers.

IV. Council.

10. The Council of the Society shall be composed of the officers for the current year, and its duties and powers shall be:—

(a) to administer the affairs, property and trusts of the Society.

(b) to elect ordinary and corresponding members and to recommend candidates for election as Honorary members of the Society.

(c) to obtain and select material for publication in the Journal and to supervise the printing and distribution of the Journal.

(d) to authorise the publication of works and maps at the expense of the Society otherwise than in the Journal.

(e) to select and purchase books and maps for the Library.

(f) to accept or decline donations on behalf of the Society.

(g) to present to the Annual General Meeting at the expiration of their term of office a report of the proceedings and condition of the Society.

(h) to make and enforce by-laws and regulations for the proper conduct of the affairs of the Society. Every such bye-law or regulation shall be published in the Journal.

11. The Council shall meet for the transaction of business once a month and oftener if necessary. Three officers shall form a quorum of the Council.

V. General Meetings.

12. One week's notice of all meetings shall be given and of the subjects to be discussed or dealt with.

13. At all meetings the Chairman shall in the case of an equality of votes be entitled to a casting vote in addition to his own.

14. The Annual General Meeting shall be held in February in each year. Eleven members shall form a quorum.

15. (i) At the Annual General Meeting the Council shall present a Report for the preceding year and the Treasurer shall render an account of the financial condition of the Society. Copies of such Report and account shall be circulated to members with the notice calling the meeting.

(ii) Officers for the current year shall also be chosen.

16. The Council may summon a General Meeting at any time, and shall so summon one upon receipt by the Secretary of a written requisition signed by five ordinary members desiring to submit any specified resolution to such meeting. Seven members shall form a quorum at any such meeting.

17. Visitors may be admitted to any meeting at the discretion of the Chairman but shall not be allowed to address the meeting except by invitation of the Chairman.

VI. Publications.

18. The Journal shall be published at least twice in each year, and oftener if material is available. It shall contain material approved by the Council. In the first number in each year shall be published the Report of the Council, the account of the financial position of the Society, a list of members, the Rules, and a list of the publications received by the Society during the preceding year.

19. Every member shall be entitled to one copy of the Journal, which shall be sent free by post. Copies may be presented by the Council to other Societies or to distinguished individuals, and the remaining copies shall be sold at such prices as the Council shall from time to time direct.

20. Twenty-five copies of each paper published in the Journal shall be placed at the disposal of the author.

VII. Amendments to Rules.

21. Amendments to these Rules must be proposed in writing to the Council, who shall submit them to a General Meeting duly summoned to consider them. If passed at such General Meeting they shall come into force upon confirmation at a subsequent General Meeting or at an Annual General Meeting.

Affiliation Privileges of Members.

Royal Asiatic Society. The Royal Asiatic Society has its headquarters at 22 Albemarle Street, London W., where it has a large library of books, and MSS. relating to oriental subjects, and holds monthly meetings from November to June (inclusive) at which papers on such subjects are read.

2. By rule 105 of this Society all the Members of Branch Societies are entitled when on furlough or otherwise temporarily resident within Great Britain, and Ireland, to the use of the Library as Non-Resident Members and to attend the ordinary monthly meetings of this Society. This Society accordingly invites Members of Branch Societies temporarily resident in Great Britain or Ireland to avail themselves of these facilities and to make their home addresses known to the Secretary so that notice of the meetings may be sent to them.

3. Under rule 84, the Council of the Society is able to accept contributions to its Journal from Members of Branch Societies, and other persons interested in Oriental Research, of original articles, short notes, etc., on matters connected with the languages, archaeology, history, beliefs and customs of any part of Asia.

4. By virtue of the afore-mentioned Rule 105 all Members of Branch Societies are entitled to apply for election to the Society without the formality of nomination. They should apply in writing to the Secretary, stating their names and addresses, and mentioning the Branch Society to which they belong. Election is by the Society upon the recommendation of the Council.

5. The subscription for Non-Resident Members of the Society is 30. - per annum. They receive the quarterly journal post free.

Asiatic Society of Bengal. Members of the Straits Branch of the Royal Asiatic Society, by a letter received in 1903, are according to the privilege of admission to the monthly meetings of the Asiatic Society of Bengal, which are held usually at the Society's house, 1 Park Street, Calcutta.



JOURNAL



Jelevu Customary Songs and Sayings.

COLLECTED BY A. CALDECOTT,

WITH PREFACE AND NOTES BY R. O. WINSTEDT.

These *lêromba* 'Songs of Origin,' and these 'Customary Sayings' *pëbilangan adat*, as they are called in Negri Sembilan or *pëpatah* to use their Minangkabau name, were collected by Mr. Caldecott in Jelevu, of which State he has written an adequate history (Papers on Malay Subjects: second series, No. 1: F. M. S. Govt. Press, Kuala Lumpur, 1912).

A great deal of material has been printed on the Minangkabau Malays of Negri Sembilan—Martin Lister's careful articles, Mr. Humphreys' Naning Proverbs and excellent Wedding Speech from Naning, papers by O'Brien and Hervey and Bland, and Messrs. Parr and Mackray's exhaustive "Rembau" have all been published in past Journals. Mr. Wilkinson, who had then never lived in Negri Sembilan, wrote an extraordinarily illuminating introduction to the *adat përpateh* in "Law II" in "Papers on Malay Subjects." Many of the articles that have appeared overlap, and the present collection is no exception. But all is grist to the mill of comparative method. "Knowledge is knowledge of relations,"—especially in the Minangkabau world!—and this paper has profited by comparison with those earlier articles; as well as with the *adat* of Minangkabau and its Sumatran colonies as delineated in Willinck's "Het Rechtsleven bij de Minangkabausehe Maleiers" (Leiden, 1909) and in the series of volumes on Malayan custom published by "Het Koninklijk Instituut voor de Taal-, Land en Volkenkunde van Nederlandsch-Indië" ('s-Gravenhage) and entitled "Adat-rechtbundel."

The comparative method has helped, for example, to explain the line *yang bër-sësap, yang bër-jërami* which puzzled the authors of "Rembau;" it has proved that for their impossible *bër-sa-orangan* the Minangkabau word *përsuarangan* (common enough in Negri Sembilan) should be restored; it has shown us that for *gëmok bër-pupok* on p. 39 of Mr. Caldecott's "Jelevu" should be read *gëmok di-përgëpökkan*.

It may be said that textual points are of dilettante interest. Well, the comparative method helps also to reveal how funda-

mental principles of very practical importance are apt to be warped by chiefs biased in some particular case in the local court.

*Sa-kali ayer gēdang
Sa-kali tēpian bēraupak,
Sa-kali gēdang bēraupak,
Sa-kali adat bēraupak.*"

" Every time a flood comes,
Landing-places shift:
Every time a duel succeeds,
Custom changes."

So runs a Minangkabau saying, and local wit has satirized the custom of the four important States of the Negeri Sembilan:—

*Pioh pilin tangkai jering adat Rēmbau;
Bērpusing adat Jēlēbu baqai kinclir;
Entah-lah, iai' adat Sēnanjong;
Bērya bērtidak adat Johol.*

" Custom in Rembau is knotty and twisted as the stem of
the *jering*;
In Jelebu it goes round like a water-wheel;
It is doubtful in Sungai Ujong;
It is contradictory in Johol."

But Malays recognize, as European students have failed often to recognize, that despite this and despite modifications admitted to make the *adat* keep pace with the times, at bottom there is only one *adat Minangkabau*:—

adat datar, pēsaka suatu.

And so well is it enshrined in old-world sayings that deviations from it can be detected easily enough. European enquirers have been too apt to accept every interested party's interpretation as correct and peculiar to his State; instead of seeking for the catholic interpretation of saying or custom:—

sa-lengkong alam Minangkabau

" throughout the circle of the Minangkabau world," where the custom has been so wonderfully conserved through centuries, even by the most distant colonists from that upland home.

For instance. On pp. 70 and 72 of " Rembau," it is stated:—

" If misfortune is all his bachelor life brings him, then (a man's) family is responsible for his debts. . . . These duties of a mother to her son arise from the principle that the holder of ancestral property is responsible for the life and blood of all members of the family. . . . Under Malay rule an insolvent debtor be-

* The N. S. version reads *pasu kuantut* for *tēpian bēraupak* and *raja* for *gēdang* in the third line.

came the slave of his creditor: he paid his debts in his body. The settlement of his debts alone preserved his free life and hence became a duty of his mother's family. The obligation of payment extended not only to the *private debts* of the bachelor, his unpaid bills, his less happy speculations and his losses at the gaming table—but also to the *utang adat* (and *utang pēsaka*.)” Now this is true still so far as *utang adat* and *utang pēsaka* are involved. Is it true to-day of a bachelor's irresponsible debts? Certainly the *adat tanggong-mēnanggong* is not so construed in Johol or in Jelebu or in Minangkabau itself. Yet judgment was once given on appeal against a Rembau's man's unfortunate female relation, the judge being loathe to reject evidence collected by the “intelligent enquiry of the local magistrate:” though in a later case of the same kind, another judge derided such an interpretation as ludicrous and opposed to principles of equity, adding caustic comments on the *adat* in general.

The Court, unlike the authors of “Rembau,” did not recognize that honest involenceny does not now entail imprisonment or affect the liberty of the debtor, so that the axiom *nyawa darah pulang ka-waris* no longer applies. Apart from that, where land speculations have undone a man, one might contend that rules framed by a frugal pastoral people did not contemplate comparatively large speculations in rubber or tin. And again private individualistic dealings in land would have been quite impossible in a strictly communal society. And the *adat* is not an inelastic code of law but bows to altered conditions.* In any case, so far from conserving the *adat* whole, our criminal courts daily give judgments anathema to its principles. But is any of this special pleading necessary? Let us hear, what Willmck writes about the *adat tanggong-mēnanggong* as interpreted in Minangkabau itself:—

“A Minangkabau Malay at all times can bind himself validly *ex contractu* only so far as his *harta pēncharian* go; *ex delicto* not only he but his whole family were bound in *adat* times—his family only if he himself could not pay for his misdeed or crime, in which case his family became liable for the smart-money according to the *adat tanggong-mēnanggong*. So a whole tribe or *nēgĕri* could become liable for smart-money, when one of its people had committed a crime, and the criminal's relatives even might become debt-slaves of the avenger. A Minangkabau Malay can never validly of his own self conclude bargains *ex contractu*, which affect *harta pēsaka*: if he contracts a bargain, no action thereon can be taken by the creditor against the man's family, but always only against the debtor and even then only against his *harta pēncharian*. The principle difference the *adat* makes between debts *ex contractu* and debts *ex delicto* is this: a man's family is liable for the former only if they are incurred properly, that is, contracted by the head

* Vide “Rembau,” p. 69, 70; and with the growth of population in the tribes (*suku*), tribal exogamy is no longer observed everywhere.

of the family after agreement (*sa-kata*) of its members; debts *ex delicto* were claimed *ipso jure* from the whole family, if the guilty member were unable or unwilling to pay."

Now that passage is perfectly clear, even though its application of terms of Roman law to the humble customs of Sumatran villagers must strike a note jarring to any ear sensitive to style and atmosphere. And Willink's account holds good of Jelebu and of Johol. *Pusing anak Rēmban* 'Did they circumvent that local magistrate? Anyhow, there is plenty of evidence to support rejection in practice of an interpretation absurd and opposed to equity.

As I said above, a great deal has been written on the customs of Negri Sembilan and a great mystery made of them. But we still lack the evidence of the people themselves, their customary sayings and maxims, their speeches on occasions of ceremony. Students generally have recorded only *dissecta membra* of the *adat*. Mr. Humphreys was the first to give us scholarly versions of long speeches. Now Mr. Caldecott gives us these *tēromba* or 'songs of origin' and a coherent set of sayings. For a later Journal I am preparing a collection of speeches from the district of Kuala Pilah; and I hope also to print one of the several versions I have obtained locally of *Undang-Undang Minangkabau*. Only when sufficient Malay material has been recorded, can we expect to get a readable definitive and comparative account of Minangkabau custom in the Negri Sembilan.

We are indebted to Mr. J. E. Nathan for the explanation of several abstruse passages.

3

Songs of Origin
and
Customary Sayings

6

TĒROMBA.

I.

Allah bĕlum bĕrnama Allah,
 Muhamad bĕlum bĕrnama Nabi;
 Bumi bĕlum bĕrnama bumi,
 Bumi bĕrnama pusat nĕgĕri:
 Langit bĕlum bĕrnama langit,
 Langit bĕrnama payong nĕgĕri:
 Bumi itu sa-gĕdang talam,
 Langit itu sa-gĕdang payong:
 Gagak puteh, bangau hitam,
 Dato' bujang, nenek gadis:
 Sa-jaman raja jatoh tĕrdiri
 Sa-jaman pĕnghulu jatoh tĕpĕkur,
 Sa-jaman lĕmbaga jatoh tĕrsila,
 Tĕrbit adat dua tĕripar,
 Ka-laut Tĕnggong', ka-darat Pĕrpatch,
 Adat bĕrtĕntu, balang bĕratur:
 Bĕrntok bĕrharta masing-masing,
 Buloh bilah, tanah di-tanam,
 Bĕsi bĕrlĕntang, puntong bĕrasap,
 Sa-bangkah tanah di-tanam,
 Tumbuh aur nan bĕrjijir,
 To' Kali Padang Gĕnting,
 To' Sĕcuma' di-Suasa,
 To' Kahfah di-nĕgĕri Tambang,
 To' Mĕngkundum di-nĕgĕri Sumanik,
 Di-sambut raja Pagar Ruvong:
 Lalu ka-Siak, ka-(?) Siam, Jambi;
 Lalu ka-Bokau, ka-Panalian:
 Lalu ka-riak yang bĕrdĕrum,
 Tĕmpat aur vau bĕrsurat,
 Tĕmpat pisan-pisau¹ hanyut,
 Tĕmpat sialang bĕrlantak bĕsi²:
 Lalu durian di-takek Raja—

1=Temenggong. 2 Indera Mah, vide note, p. 16. It is pronounced in Minangkabau *Indome 3 Riak* 'ripples' or is it some forgotten place-name?

4. We have followed the editor of the "Undang-Undang of Moco-Moco" in translating *pisau-pisau* vide Vol II 'Miscellaneous' (Bencoolen, 1822), p.5. A similar interpretation is given at Sri Menanti.

5. That paper also explains *Su-pisau pisau hanyut, Sudang bĕrlantak bĕsi* and *Durian di-takek raja* as names of places, the last opposite to *Tanjong Si-Mulio*. *Sudang bĕrlantak bĕsi* is translated "the honey-comb reached by means of iron pegs driven into the tree." There is no doubt that *sialang*

SONGS OF ORIGIN.

I.

Ere God was known to men as Lord
 Or Muhammad as His Prophet.
 Ere Earth was given the name of Earth,
 When Earth was called the country's navel,
 Ere sky was designated sky
 When sky was called the world's umbrella:—
 Earth no bigger than a salver,
 Sky no larger than a sun-shade:—
 Crows were white and black were egrets;
 Our first forebears, boy and maiden
 Knew not yet the bond of wedlock;
 When to earth a prince fell standing,
 And the first of chiefs fell pensive,
 And the first of tribal headmen
 Fell in attitude of homage:—
 Then arose two ways of custom,
 One to seaward, that of Tenggong.
 Landward one, that of Perpatch.—
 Custom sure with its set sayings,
 Giving each his share and portion.
 Bamboo laths were split for building,
 Mankind tilled the earth primeval.
 Iron clinked and log-ends smouldered,
 Clods were turned for tilth and planting,
 Bamboo stems grew up in order.
 To' Kali ruled in Padang Genting
 To' Senama in Suasa,
 To' Kalifah in land of Tambang,
 In Sumanik To' Mangkudum:
 The prince of Paggarruyong hailed it
 And the custom went to Siak,
 Then to Siam and to Jambi
 To Rokan and to Panalian

here = "large trees on which bees have built a nest" (and such trees are still *pēsaka* in Negri Sembilan); below, we get *si-balong* as a variant. And it is probable that the iron pegs were driven in as "climbing steps" and not as boundary-marks: though another customary phrase *lantak bērtukul* = "the boundary-marks that are hammered in," not "the boundary posts that are beaten," as the authors of "Rembau" (*Journal* 56, p. 108 XXIII) translate it, if by that rendering they allude, as one would infer, to "beating bounds":—their note on p. 47 is correct.

Bukan raja sa-barang raja,
 Raja asal, raja usul,
 Raja mēnitek dari langit,
 Sama ada dēngan kayu-kayuan,
 Sama tumbuh dēngan rumput ranting;
 Keturunan raja bērdarah puteh:
 Nan tēgak mēngangkat sēmbah,
 Nan dudok mēnangkat sila;
 Bēri makan sa-jambar sa-orang;
 Minum di-tabong bērpalut ēmas,
 Tidur di-tulam nan bērtēkat.

Di-mana jalan Baginda Giri?

Di-baroh balai panjang.

Mana bēnar adat tēdiri?

Di-Batipuh, Padaug Panjang.

Siapa yang chērdek bijaksana?

Pertama To' Pērpateh, kēdua To' Tēnggong.

Yang mēngētahu jalan dua tēripar;

Nama jalan dua tēripar.

Pertama jalan karna Allah.

Kēdua jalan ka-pada dunia.

Jalan Allah, pertama mēnguchap,

Kēdua sēmbahyang, kētiga zakat.

Kēempat puasa, kēlima naik haji

Jalan ka-dunia itu.

Pertama gong dan chanang.

Makan dan minum.

Sēmanda-mēnyēmanda.

Kēmendian maka di-bilang—

Sa-hēlai akar yang putus,

Sa-bingkah tanah yang tērbalek,

Sa-batang kayu yang rēbah;

Sa-batang kayu akan mēlintang,

Sa-bingkah tanah akan pērmatang,

Sa-hēlai akar akan bērikat.

Tanah-nya datar, pērmatang-nya lurus,

Orang ramai, padi mēnjadi.

Kēmudian

Raja bēralam, pēnghulu bērluak,

Suku bērlingkongan,

Ibu-bapa bēranak buah,

Anak buah dudok bērsuku-suku.

And to sea-laved sounding beaches
 Where were found the bamboo writings,
 Roof-tree carved on water drifting,
 Trees with spikes to climb for honey.
 Then the Raja marked the fruit trees,
 He a prince of no mean station,
 He the first king, king *primaeval*.
 Dropped he as the rain from heaven,
 He with forest-trees *coeval*,
 Old as grass at the beginning;
 White the blood that in him flowed:
 Erect men made him salutation,
 Sitting yielded him obeisance;
 Food men brought him, each a platter;
 Drank he from a bamboo beaker
 Overlaid with golden plating;
 Slept on an embroidered mattress.

"Where is the path of the prince of Giri?"

"On the river-side of the long palace."

"What proof is there of the creation of the custom?"

"It came down to Batipuh in Padang Panjang."

Who the wise men and the clever?
 First Perpatch, second Tenggong,
 Who knew well the kindred custom,
 First the custom God inspireth,
 Second that of worldly teaching.
 The way to God is, first, the *credo*,
 Second prayer, the third almsgiving,
 Fasting fourth, and fifth the *haj*:
 The worldly way is gong and clapper
 Calling men to food and liquor,
 To marry and to take in marriage.

After comes the saying.—

A broken root, a clod turned upward,
 A fallen tree to serve as barrier,
 The upturned clod to bank the rice-field,
 The trailing stem to bind together.
 Flat the plain and straight the bankings,
 Thick the folk and rich the harvest.

Then the prince was given his kingdom,
 The chief his shire, the tribe its limits,
 The village elders their dependants;
 Men were then by tribes divided,
 And the tribes were twelve in number.

Bêrapa suku-nya? Dua-bêlas,
 Knndur mênjalar ka-nih,
 Labu mênjalar ka-bilir,
 Puchok-nya sama di-gêrtas
 Buah-nya sama di-tarek;
 Dêkat rumah, dêkat kampong,
 Sa-kampong sa-pêrnainan,
 Sa-jamban sa-pêrmandian.

II.

Sa-jaman si-gadis si-Mara Chindai,¹
 Mêlapus² pulan tanah Melayu;
 Bêrlayar-lah ia dêngan përahu-nya,
 Lalu têngalang-lah përahu-nya;
 Maka bêngêlar-lah ia Batin Maha Galang³
 Di-tengok-nya puchok mëranti bëranchaman,
 Nêgëri pun sapërti ombun.
 Mêngatur ia adat di-bukit itu:—
 Sa-hêlai akar putus akan pêngikat,
 Sa-batang kayu rëlah akan bërintang,
 Sa-bingkah tanah tërbalak akan tanam-tanaman,
 Maka bërjumpa ia dêngan yang bërempat;
 Bërtauva Batin Maha Galang,
 Mênjawab Dato' yang bërempat
 Di-atas bukit si-Utang-Utang Pënjaringan,⁴
 "Hêndak mënchari pamah yang lebar,
 Hêndak mënchari sungai yang mëlurut;
 Mêminum ayer bungkul,
 Bêralas telur dann lerek,
 Bêrbantalkan laur durian."
 Bêrkata lagi Dato' pada Batin,
 "Turuni-lah londaran naga;
 Nak tahu pulau yang mênumpang,
 Tanyakan pada dënak;
 Nak tahu padang yang luas,
 Tanyakan pada bilalang;
 Nak tahu pulau yang panjang,
 Tanyakan pada barau-barau."

Putus sa-hêlai akar,
 Sa-bingkah tanah yang tërbalak,
 Sa-batang kayu yang tumbang,
 (Maka bërjumpa-lah dato' Batin mëninggalan adat)

1. Possibly *Mêrah* or *Marah*, an old Sumatran title; but was it confined to males? 2? = *hapus* 3 = *Mêrgalang* 4. Ancient Palembang.

Then the marrow clambered upstream,
 And the gourd grew trailing downstream,
 Till their shoots were pruned together,
 And their fruits together taken,
 House to house grew near together,
 Hamlet clustered on to hamlet,
 For their games men used one common,
 Used one shelter for their bathing.

II.

In the time of Mara Chindai
 Isles Malayan all were flooded,
 So he took to boat, went sailing,
 Until lo! his boat was stranded
 On our shore: and so we named him
 "Mighty chieftain, from the wreckage."
 On a hill he took his station,
 Gazed he round upon the treetops
 Clustering, crowded: and the country
 Rolled, a misty sea, below him,
 There did he ordain the custom:—
 "A trailing stem shall serve for binding,
 The fallen tree trunk for a barrier,
 The clod upturned for tilth and planting."
 Then the Batin Maha Galang
 Met the Four, and asked them questions;—
 On Palembang hills they answered,
 "I would seek a spacious valley,
 I would look for water courses,
 Tho' I tap the palm for water,
 Sleep with rustling leaves beneath me,
 A tree buttress for my pillow."
 Then the chiefs to him made answer,
 "Follow down the dragon's traces,
 And if thou would'st find the hillocks,
 Islets footed in the marshland,
 Jungle fowl shall be thy leaders:
 Seekest thou the spreading meadow,
 By the grasshopper be guided:
 The spit of hills between the valleys
 By the bulbul shall be shown thee."

So the trailing stems were severed,
 So the clod of earth turned upward,
 And the trees fell to the woodmen,
 (Then they met the Batin chieftain
 And forsook the older custom:)

Takek kayu Batin Jēnang;
 Hela tali pada Waris;
 Putus tēbus pada Undang;
 Lantak bērtukul pada Lēmbaga,

Maka di-tengok

Alat kampung yang bērsudut,
 Sawah yang bērlopak,
 Rumah yang bērkatak' tangga,
 Bilek yang bērbunyi

Maka ada-lah adat

Tēdekala pēgēri sudah lebar,
 Orang pun sudah ramai,
 Adat bērtentu, bilang bēratur;
 Bēroleh kēhil pada yang gedang,
 Bēroleh yang gedang pada yang tua.

Apa-lah kata orang tua?

" Dalam alam raja-nya,
 Dalam luak pēnghulu-nya,
 Dalam suku lēmbaga-nya,
 Bērumpok masing-masing,
 Bērharta masing-masing,
 Harta orang jangan di-tarek,
 Untok anak jangan di-bērikan."

Dudok kita bērpēlارا-an,
 Bērdēkat rumah, dēkat kampung,
 Boleh minta-mēminta,
 Akan jēngok-mēnjēngok
 Sakit dan pēning,
 Sa-jamban sa-pērulangan,
 Sa-pērigi sa-pērmandian,
 Sa-laman sa-pērmanan;
 Tanah-nya datar, ayer-nya jērneh,
 Muafakat-nya ēsa.

III.

Usul-usul, asal-asal!
 Asal jangan di-tīnggalkan:—
 Hujan bērpohon, kata bērasal,
 Sakit bērmula, mati bērsēbah:—

1. *Katak* is said to = 'short-runged,' as opposed to the wide-runged bamboo ladders of temporary huts.

JELEBU CUSTOMARY SONGS AND SAYINGS.

The jungle chiefs mark off the tree trunks;
The Waris drag the cord of survey;
The ruler of the shire, the Undang,
Settles payment for the portion;
The tribal headman hammers landmarks.

Next we see the jungle custom
Yield to custom of the hamlet:—
Holding dovetailed into holding,
Split in lots the ricegrown meadows,
Short-runged ladders fixed to houses,
Rooms with voice of men resounding.

So the men wax strong in number,
And the lands they till grow wider,
And the custom of the hamlet
Groweth to a broader custom,
Stablished custom with set sayings.
The grown hath lordship of the little,
O'er the grown the old have lordship.

Hark ye then! how say the old men?
"The king within his kingdom reigneth,
The chief within his shire commandeth,
The headman o'er his tribe presideth.
Each shall get his share and portion;
Take ye not the goods of others;
Squander not the children's birthright."

So we gathered close together,
Homestead clustering on homestead,
Neighbour marrying with neighbour,
Visiting in time of sickness;
Used one shelter for ablutions,
From one well drew bathing water;
For our pastimes used one common;
Level was our land, our water
Clear, and in our village councils
Trusted each his neighbour's promise.

III.

Origin of origins!
Desert we not our origin:—
Rain hath its fount, tradition its foundation,
Sickness hath its beginning, death its cause:

Asal jangan di-tinggalkan.

Ka-laut adat Dato' Tēmenggong.

Ka-darat adat Dato' Mērpateh.

Ka-laut adat Dato' Tēmenggong :—

Siapa mēnjala, siapa tērjun.

Siapa salah, siapa bērimbang :

Siapa bērutang, siapa mēmbayar :

Siapa bunoh, siapa kēna bunoh.

Ka-darat adat Dato' Mērpateh :—

Hutang nan bērturut, chagar bērsadai ;

Chinchang pampas, bunoh bēri balas.

Tērbūt adat sa-rarah Pazar Ruyong,

Sa-lilit Pulau Pērcha.

Sa-limbang tanah Mēlavu.

Sēri Alam di-Minangkabau.

Sultau di-Pazar Ruyong :

Titah di-Sungai Tērap :

Indra Maha¹ di-Suasa :

Kali di-Padang Gēnting.

Makhdum di-Sumanik.

Sengkat durian di-takek raja.

Si-balong bērlantak bēsi² :

Sengkat si-lukah-lukah haurvut.

Sengkat pērentahau Pazar Ruyong.

Sa-jaman Dato' bujang, nenek gadis.—

Puteh kēpala tētēkala itu :

Gagak puteh, bangau hitam.

Ayer-nya jēmeb, orang-nya ramai.

Adat sēntosa di-dalam nēgēri.

Buloh bilah, piutong bērasap.

Bēsi nap bērlocheng.

Sa-bēlai akar akan pērikat.

Sa-bingkah tavah akau pēnggalang.

Kēmudian dudok pandang-mēmandang :

Pandang ka-darat, mēranti yang bērsanggit dahan,

Pandang ka-hulu gunung nan dalam.

Pandang ka-hilir sungai nan mēlurut.

Pandang ka-baroh lēpan nan luas.

1. Jelebu reciters say *Antara mudel*, which is obviously corrupt. *Undang-Undang, Moko-Moko* read اندرما and romanize it *Inder Mah* : the *Tuan Panjang* of Saruasa is intended : see, for instance, p. 8 of van der Toorn's *Tjindoer Mofe* (Batavia, 1886) At Sungai Trap was the Bendahara.

2. Vide note p. 8 *supra*. *Si-balong*=*balong ijan* "a large tree, *Euphrinus malayanus*."

Forget we not our origin.

To seaward was the custom of Dato Temenggong,
To landward was the custom of Dato Merpatih.

Now the law of Dato Temenggong to seaward is this.
Who casts the net shall jump to drag it in;
Who commits an offence shall compensate;
Who owes shall pay: who slays shall be slain.

And the law of Dato Merpatch to landward is this:—
A debt adheres to the tribe of the debtor;
A mortgage becomes a lien on the tribal land;
Who wounds shall pay smart money, who kills shall give
restitution.

The custom arose in Pagar Ruyong,
It engirdled Pulau Percha.
It throve in the Malayan regions,
Glory of Minangkabau.
Was the Sultan in Pagar Ruyong;
Mandates issued from Sungai Trap;
Indra Maha was at Saruasa:
The Kali was at Padang Gënting.
The Makhdum in Sumauk.
As far went the custom as the trees,
The fruit-trees marked by the raja for his people,
The trees with spikes to climb for honey
As far as fish traps drifted.
Up to the kingdom of Pagar Ruyong.

In days ere our ancestors were wedded,
When the hair of man was white,
And crows were white and egrets black;
Waters were clear and men were many,
And custom brought peace on the land:
The bamboo was split, the log smoked in the clearing,
And the clink of iron was heard.
The trailing creeper served for binding,
A turned-up clod for barrier.

Then the folk sat looking about them:—
Hillward rustled the branches of forest trees;
Upstream were deep ravines;
Downstream the flowing river;
Below the spreading meadows.

Turun di-Pagar Ruvong raja bĕrdarah puteh,
 Bĕrdua dĕngan Batu Mĕrgalang;
 Lalu naik gunung Rĕmbau,
 Lalu turun Sĕri Mĕnanti.
 Kĕmudian dudok bĕrsuku-suku.
 Suku-suku nan dua-bĕlas
 Suku nan bĕrtua, bĕribu-bapa, bĕrlĕmbaga:
 Kĕmudian dudok bĕrdĕkat kampong,
 Laman sa-buah sa-pĕrmainan,
 Jamban sa-buah sa-pĕrulangan,
 Pĕrigi sa-buah sa-pĕrmandian.



There descended in Pagar Ruyong together
A king of white blood and Batin Mergalang;
They journeyed and climbed the Rembau hills;
They passed down to Sri Menanti.
Then men dwelt there in tribes, the twelve tribes:—
A tribe has its old men, its elders, and its headman.
Afterwards their homes grew close together;
For their games men used one common;
Used one shelter for their bathing;
From one well drew their drinking water.



PĒBILANGAN ADAT.

We are Min-
angkabau
folk.

Kita anak Minangkabau,
Yang di-bawah langit dan di-muka bumi,
Sa-lingkar Gunung Bĕrapi,
Sa-hingga Pintu Raya hilir,
Hingga Si-Lĕgundi mudik,
Yang bĕrnama tanah Sumatĕra,
Pulau Andĕlas.

Not till the
pastoral age
did we get
our custom
of entail.

Sa-bingkah tanah tĕrbalek,
Sa-hĕlai akar yang putus,
Sa-batang kayu rĕbah—
Adat dĕngan pĕsaka bĕlumi di-adakan.

and our
political &
social
system:

Tĕtĕkala
Kampung sudah bĕrsudut,
Sawah sudah bĕrjinjang,
Puchok sudah mĕliok,
Pinang sudah bĕrjijir
Adat dĕngan pĕsaka di-adakan, ia-itu—

Alam bĕraja,
Luak bĕrpĕnghulu,
Suku bĕrtua
Anak buah bĕribu-bapa.
Orang sĕmanda bĕrtĕmpat sĕmanda.¹

with grades
and pre-
cedents

Kunchi bini laki,
Kunchi sĕmanda tĕmpat sĕmanda,
Kunchi anak buah ibu bapa.
Kunchi luak pĕnghulu.
Kunchi alam raja.

and a
widening
scope for
our customs.

Adat yang bĕrjanjang² naik, bĕrtangga turun;³
Bĕrlukis, bĕrlĕmbaga.⁴
Bĕrtiru,⁵ bĕrtĕladan.

Pulai nan bĕrpangkat naik.
Manusia bĕrpangkat turun.

¹ Sometimes are added:

*Gĕdong bĕrtaulĕh, pari bĕrpogana,
Po bĕrbun, qĕlanggang bĕrjuara.*

*Shops have keepers, mining sluices diviners to open them,
Gamug tables croupiers, cock-pits trainers of cocks.

² *Jurang* "the steps of a ladder—to the *pĕcau* or roof loft."

³ I.e. Society and the political constitution has different grades. A *titah* will go downwards through the Undang to the Penghulus, through the Penghulus to the Lembagas, through the

CUSTOMARY SAYINGS.

We are children of Minangkabau,
 Who dwell beneath the sky and on the face of the earth,
 Of the land around Gunong Mèrapi,
 As far downstream as Pintu Raya,
 As far upstream as Si-Lègundi,
 The land that is called Sumatra,
 The island of Andalas.

When the first clod was upturned
 And the first creeper severed,
 And the first tree felled—
 Our custom and system of entail were not yet es-
 tablished.

When holding was dovetailed into holding,
 When our stretches of rice-field were made,
 When the shoots of our plants swayed in the breeze,
 When our betel-palms grew up in rows
 Then were established our custom and system of entail.

Our world got a prince,
 Our shires chieftains,
 Our tribes elders,
 Our families headmen,
 And the married man found a place with the family
 of his wife.

Warder of the wife is the husband,
 Warder of the husband his wife's family.
 Warders of the family its elders,
 Warder of the shire the chieftain.
 Warder of the world the king.

Procedure under the Custom is to ascend and descend
 by grades,

As men go up and come down the rungs of ladders.
 Custom with its lines and patterns.
 Its precedents and instances.

The *pulai* tree broadens as it grows up.
 Family trees as they descend.

Lembagas to the Bnepas; and a petition to royalty should go upwards through the same stages. *Vide* "Adatrechtbundel, VI," p. 205-6, where a far-fetched interpretation is condemned and one similar to that accepted in N. S. upheld.

* *Limbaga* = 'mould, matrix, pattern,' and the context shows clearly that it has that meaning here.

† Minangkabau *pipatah* read *birtiru*, which we have adopted. The Jelebu reading is *birturis*. For "Rembau's" *birturas*, no support can be found in Minangkabau *pipatah* or Van der Toorn's "Weerdenboek."

Each individual in our society has his peculiar duty,

Kambing biasa mēmbebek,
Kērbau biasa mēnguak,
Ayam biasa bērkokok,
Murai biasa bērkichau,
Pēnghulu biasa mēnghukumkan adat,
Alim biasa mēnghukumkan shara',
Hulubalang biasa mēnjarah,
Juara biasa mēlēpas,
Saudagar biasa bērmmain bungkal tēraju,
Pērēmpuan biasa bērusahakan bēnang dan kapas

which none may usurp;

Raja sa-kēadilan,
Pēnghulu sa-undang,
Tua sa-lēmbaga,
Waris sa-pēsaka,
Ibu- bapa sa-adat,
Tēmpat sēmanda satu shahadat,
Orang sēmanda sa-rēsam.¹

and his prerogatives

Raja bērdaulat,
Pēnghulu bērandika;
Raja bērtitah,
Pēnghulu bērsabda;
Raja bērkhalifah,
Pēnghulu bērsuku.
Undang bērkēlantasan,
Lēmbaga bērsēkat.
Raja bērsējarah.
Pēnghulu bērsalasilah,
Lēmbaga bērtēromba.

and honour in his own place.

Raja bērdaulat dalam alam-nya,
Pēnghulu bērnobat dalam suku-nya,
Buapa bērnobat dalam anak-buah-nya,
Orang banyak bērnobat dalam tēratak-nya.

Obedience to whom obedience is due.

Salah hamba ka-pada tuan,
Salah murid ka-pada guru,
Salah anak ka-pada bapa,
Salah bini ka-pada laki.

Titah di-junjong sa-pēnuh-pēnuh kēpala,
Sabda di-pikul sa-untok-untok bahu.

Covenant makes men of one mind.

Kēlēbahan umat dēngan muafakat,
Kēlēbahan nabi dēngan makjizat;
Bulat ayer karna pēmatong.²
Bulat manusia karna muafakat.

¹ I.e. the *adat pinang-mēminang*.

² At Sri Menanti *gopong* 'a coconut-shell water vessel' takes the place of *pēmatong*.

Goats are wont to bleat,
 Buffaloes to low,
 Cocks to crow,
 Magpie-robins to whistle,
 Chiefs to administer customary law.
 Religious authorities Muhamadan law,
 Captains to make raids,
 Trainers to fly cocking-cocks,
 Traders to finger weights and measures,
 Women to be busy with cotton and thread.

The king carries out his justice,
 The chief his law,
 The tribal headman his ancestral rights,
 The inheritors their entail,
 Heads of families their custom,
 The bride's kin their sworn profession,
 The husband his conventions.

A king is sacrosanct,
 A chief honourable,
 A king issues mandates,
 A chief commands.

A king is God's deputy,
 A chief his tribe's¹.
 The powers of a chief are wide,
 The powers of a tribal headman restricted.
 A king has his royal annals,
 A chief his genealogical tree,
 A tribal headman his song of origin.

The king is sacrosanct within his realm,
 The chief receives recognition within his tribes,
 The heads of families within their dependants,
 Common folks in their own homes.

Slaves can offend against their masters,
 Pupils against their teachers,
 Children against parents,
 Wives against husbands.

We lift our hands high in homage to execute the
 king's mandates.
 We put our shoulders to carry out a chief's commands

The greatness of men lies in taking counsel together;
 The greatness of prophets in performing miracles.
 As a bamboo conduit makes a round jet of water,
 So taking counsel together rounds men to one mind.

¹ Or ? "rules his tribe."

Custom is
based on
covenant.

Tētēkala kēchil bērrama muafakat,
Tētēkala bēsar bērnama adat:
Si-raja adat ka-pada muafakat.
Ayer mēhurut dēngan bandar-nya,
Bēnar mēhrut dēngan pakat-nya,
Nēgēri bērtunloh dēngan adat-nya.

But coven-
ant alone
may be
partial.

Muafakat lalu di-dalam gēlap,
Adat lalu di-tēngah tērang.
Hilang adat karna muafakat.

We live
secure in
the lap of
our custom:

Hidup di-kandong adat.
Mati di-kandong hami.

and trans-
gression
breaks the
trans-
gressor.

Bujur lalu, lintang patah:
Makanan adat dēngan pē-saka.

Custom
speaks with
the voice of
greatest
authority:

Kata orang kata bērchalun,¹ kata bērbalok.
Kata pēgawai kata bērnlong.
Kata hulubalang kata tunggai.
Kata undang kata pērhuasan.
Kata raja kata bērliput.
Kata maalim² kata hakikat.
Kata adat kata yang bēnar.

prescribing
the way we
must follow.

Ka-laut mēnuju alur:
Ka-darat mēnuju bēnar:
Bērtahun mēnuju musim.
Kalau ta' mēnuju alur, tumpat karam:
Ka-darat ta' mēnuju bēnar, siar bakar:
Bērtahun ta' mēnuju musim, sambang hangus.

and our
attitude to
life;

Bērdiri mēninjau jarah,
Dudok mēraut ranjau,
Mēnyērodok gelas lalu.
Mēnyēlam minum ayer,
Lain bidok lain galang.

and remind-
ing us of the
penalties of
folly.

Kaki tērdorong, badan binasa:
Chēpat tangan, dapat utang:
Mulut tērkata-kata, ēmas pada:
Tērpijak bēnang arang, hitam tapak.

¹ "Disputatious."

² Jelebu reads *ilmu*, obviously a corruption of the usual Minangkabau version, which we have adopted.

What in the beginning are covenants
Grow up into customs:
Custom is lord over covenants.
Water proceeds along water-ways,
Sanction proceeds from covenant:
A country grows up with its customs.

Covenants proceed in the dark.
Custom walks in the light:
Covenants can destroy custom.

In life we are lapped in custom.
In death we are lapped in the earth.

Length-ways one gets through, cross-wise broken.
Our custom of entail is our sustenance.

The words of common folk are contentions,
The words of officials weighed,
The words of captains terse.
The words of chiefs elaborate,
The words of the ruler comprehensive,
The words of the wise true,
The words of the custom sanctioned.

At sea aim for the channel,
On land aim at the sanctioned way,
For planting-rice, at the due season.
Miss the channel and your boat founders,
Miss the sanctioned way and you get burnt,
Miss the season and your crop is parched and fails.

Stand up to look out for raiders,
Sit down to whittle a stake.
Stoop to get your shoulder-wallet through,
Put your mouth in the stream to drink water.
Suit your rollers to your boat.

A slip brings destruction,
An open hand debts,
A quick tongue fines.
Tread on pitch and your sole is defiled.

Custom
comprises
three
branches:—

(1) the law
of nature,

(2) the law
of man,

(3) the law
of God.

Its function
is different
from that
of Muham-
madan law.

Keputusan adat tiga perkara:—

Pertama adat man-siang¹ ia-itu terjali.

Kedua adat tiang ia-itu adat berkėbulatan.

Ketiga adat kitabu'llah ia-itu hukum Kuran

Pada adat mēnghilangkan yang burok.

Mēnimbulkan yang baik:

Pada shara' mēnyuroh bėrbuat baik.

Mėninggalkan bėrbuat jahat.

Adat bėrsėndi hukum.

Hukum bėrsėndi kitabu'llah.

Kuat adat. ta' gadoh hukum.

Kuat hukum. ta' gadol adat.

Ibu hukum muafakat.

Ibu adat muafakat.

And the
evidence re-
quired by it
different.

Adat bėrtanda. hukum bėrsaksi:

Adat yang tiba ka-gėlap mėnjala.

Tiba ka-tėrang mėnumpu:

Tinggi di-sigai.

Kėras di-takek.

Lėmbut di-sudu.

Sah, kata adat.

Apa-bila tėrtanda. tėrberi:

Tėrkėjar. tėrlėlah:

Tėrpakok, tėrpank:

Dėkat, tėrtunjokkan:

Jauh, tėrkatakan.

Custom
accepts cir-
cumstantial
evidence of
theft

Undang-undang churi:

Pantang dua-bėlas—

Tiang tėrpalang.² dinding tėrėtas.

Tėrkėjar tėrlėlah.

Tėrėbut tėrampas.

Tėrchinchaug tėrpakok.

Di-gėdabaug. di-gėdabekkan.³

Di-sėrang. di-kėlėkai.

Nama kinchaug kėhoh.

Bėrauggur. kalak-kalak.⁴

Tiga kali ėmpat sa-puloh dua.

¹ E.g. *Patah tumbuh* 'when an officer dies, a successor must be chosen' is *adat mansiang*; *hilang bėrganti* 'if an officer vanishes, another must be chosen in his place' is *adat tiang*—for if a man goes into the forest and does not return, it is presumed by the *adat tiang* that he is dead.—A.C.

Custom may be split into three branches:—

Custom clear as the triangular rush in a rice-field.
Custom strong and round as a pillar, whereon all men
agree.

Custom laid down in God's book, the law of the Koran.
It is for custom to suppress the wrong,
To bring the good to pass.
It is for religious Law to command righteousness
And bid men eschew evil.

Customary law hinges on religious law.
Religious law on the word of God.
If custom is strong, religion is not upset:
If religion is strong, custom is not upset.
Religious law is the offspring of covenant,
Customary law also the offspring of covenant.

Customary law requires signs of guilt.
Religious law calls for witnesses.
When customary law deals with circumstances obscure,
It throws a wide net to catch the offender:
In clear cases it has a sure footing:
If the problem be high, it uses a ladder.
If it be hard, it cleaves into it,
If it be soft, it ladles.
'There is a clear case' says custom.
When there is evidence of guilt and information laid,
When a man is chased from the scene of the crime and
is found panting:
When there are hacks and cuts:
If evidence be at hand, it requires to be shown it.
If it be not at hand, it requires it to be related.

By the laws for theft
Twelve circumstances are forbidden:
To set a strut against a house-pillar, to rip open a
partition:
To be chased and caught panting:
To be found with booty snatched or stolen by force:
To be found wounded and hacked:
To be found with fluttering heart or trampled foot-
prints:
To be convicted of swindling and cheating:
To have transplanted and to give a crooked story.
For $3 \times 4 = 10 \div 2$.
(And these twelve signs are circumstantial evidence).

² Cf. "Adatrechtbundel" VI, p. 398.

^{3, 4} The translation is doubtful.

and of all
crimes, so
that men
must walk
warily.

A criminal
leaves traces
of his crime
and cannot
explain his
movements.

Where
there is
smoke, there
is fire²—
that is one
of our legal
maxims.

We seek
for perfect
justice.

and fair
sentences,
deterrent
but not
vindictive

Application
must be
made to the
proper
tribunal.

Different
cases must
be tried

Ēnggang lalu, ranting patah.
Mara hinggap, mara terbang.
Lalu hangus, surut layu.
Tērgesek kēna miang,
Tērgēgar kēna ěmbun

Bērsnrih ba' si-pasin,¹
Bērlondar ba' langkitang.
Bērbau ba' machang.
Ka-huht ta' tēntu gaung-nya.
Ka-bihr ta' tēntu knala.

Mana anjing mēnvalak, di-situ biawak mēmanjat;
Mana tēnmiang tērtak, di-situ tanam-tanaman jadi;
Mana kayu tumbang, di-situ chēndawan tumbuh
Kilat bēlong ka-pada kaki,
Kilat pisau ka-pada tangan,

Chupak yang pēpat,
Gantang yang piaw.
Bongkal yang bētul.
Tēraju yang baik,²
Tiada boleh di-aleh lagi.

Tiba di-mata, jangan di-tēlapkan;
Tiba di-pērut, jangan di-kēmpiskan.
Ular di-palu biar mati.
Kayu pēmalu jangan patah.
Tanah di-palu jangan limbang.
Lēmah liat kayu akar.
Di-lēntok mau, di-patah jangan.

Mēbumlok di-lēsong,
Bērtamak di-pēriok.

Ka-pada raja
Hari malam, bulan (?) bēsirau.
Kērbau bērlaga dalam kandang
Ka-pada mudang
Ayam hitam terbang malam.
Hinggap kayu bērdau.
Ka-pada lēmbaga
Ayam putih terbang siang.
Hinggap kayu mēranting.

¹ Cf. "Adatrechtbundel" VI, p. 445.

² Malay casuists distinguish four points in these four lines =
(1) = if the bench of judges be full (2) = if they have full

The branch breaks, as the horn-bill passes,
 Where danger alighted, danger must fly away.
 Pass through flames and you are scorched,
 Retreat from them and you wilt.
 Rub against the stem of a bamboo and you itch,
 Shake it and you are sprayed with moisture.

Crime leaves its trail like a water-beetle,
 Like a snail, it leaves its slime:
 Like a horse-mango, it leaves its reek.
 A stream that knows not its source nor its mouth,—
 Like that is a man who cannot account for his doings.

A spot where a dog barks is the spot where the iguana
 climbs,
 A spot where the bamboos are uprooted, is a spot where
 plants flourish.
 A fallen tree is the place for mushrooms to grow.
 The glint of an adze falls on a man's feet.
 The glint of a knife on his hands.

The quart measure that is full,
 The gallon measure that is true,
 The weight that is just,
 The scales that are even,
 These cannot be upset.

What comes before your eyes—be not blind to it;
 What comes to your mouth,—get fat on it.
 If you strike a snake, kill;
 But let not your stick be broken
 Nor the ground dented by your blow:
 Pliant but strong is a rattan.
 Let it bend but not break.

Pound in a mortar.
 Cook rice in a pot.
 It is a case for the ruler's court,
 When at night in the dark of the moon
 Buffaloes fight in the byre.

It is a case for the chief's court,
 When a black fowl flying by night
 Settles in a leafy tree.

It is a case for the tribal headman's court,
 When a white fowl flying by day
 Settles on a leafless twig.

authority (3) = if the weight of evidence is sufficient (4) =
 if the judges are just.—A.C.

These lines imply that complaints must be laid before the
 proper court and also that the punishment must fit the crime.

and different
punish-
ments im-
posed by
different
officers.

The raja's
power is
almost un-
limited.

Crimes
against
custom
are—

and certain
evidence
admittedly
conclusive.

The penal-
ties for
wounding
and for
homicide.

Tah pēngikat dari-pada lembaga,
Kēris pēnyalang dari-pada undang,
Pēdang mēmanchong dari-pada kēadilan.
Tikam ta' bērtanya,
Panchong ta' bērkhabar.

Hukuman raja
Ēnam-puloh ēnam kupang.
Tujoh tahl, sa-paha,
Sa-kēndi, sa-kēndēri,
Sa-si lēsang pēsok,
Sa-ruas buloh tēlang,
Sa-kochong lēngan baju.¹

Dahaga dabagi,²
Sumbang, sadah,³
Rēbut, rampas,
Siar, bakar,
Maling, churi,
Kichang, kichoh,⁴
Upas,⁵ rachun,
Tikam, bunoh,⁶
Samuu, sakal,—
Pantang ka-pada adat.

Upas rachun, sisa makan.

Chinchang pampas;⁷ bunoh bēri balas,
Anak di-panggil makan,
Anak buah di-sorong 'kan balas.⁸

¹ In Mnar the following lines are added:—

Sa-gantang ulang-ulang,

Sa-pēting tali bajak.

² "Opposition to and uproar against constituted authority"

—Willink, p. 347 and Van der Toorn's "Woordenboek." *Dēr-haka chīlaka*, which often precedes this line in N. S., is a paraphrase of it.

³ *Salah* = *sīsalahan* "fornication" and is reckoned constantly as a separate crime in Minangkabau lists of *salah dua-puloh*.

⁴ *Kichang* and *kichoh* both occur: *v.* Van der Toorn's "Woordenboek." For *kichong* some Minangkabau MSS. read *lanchong* and explain it as including "embezzlement" unlike *kichoh* which means all other forms of "swindling."

⁵ *Upas* = drugging with intent to render senseless but not to kill.

⁶ *Bunoh* embraces wilful murder, culpable homicide, and accidental homicide.

The cord of arrest is the prerogative of the tribal headman,
 The creese of execution the prerogative of the chief,
 The headman's sword the prerogative of the king.

The extent of a raja's jurisdiction is—
 Cents sixty and six,
 Seven taels, one *paha*,
 One *kēndi*, one *candareen*.
 The contents of a tiny mortar,
 As much as a joint of giant bamboo can hold,
 As much as will fill the sleeve of a coat.

Lese-majesté and disorder,
 Irregular marriage and wenching,
 Stealing by force and snatching,
 Arson and burning,
 Privy theft and open pilfering,
 Swindling and cheating,
 Drugging and poisoning,
 Stabbing and slaying,
 Robbery with violence, robbery with wounding.—
 These are forbidden by custom.

To test drugs or poison, give the remnants of the dish
 to the suspect.

For wounding smart-money is the penalty.
 For slaying the substitution of a person to the dead
 person's tribe.
 The children of the murderer are invited to the feast
 of atonement,
 And one of his tribal kin given to the tribe of the
 murdered man.

⁷ Restitution was in ratio to the amount of blood shed. If the man wounded lost little blood, a fowl was given by his assailant, if much a goat: it was thought that no man could lose more than a goat's measure of blood and live. The animal was cooked and the flesh presented to the aggrieved party. The offender took half a cupful of blood of the animal slain, a handful of rice and three limes. He took the injured party to a stream or well and anointed his head first with blood, then with rice and finally with juice of the limes to cleanse away the unsavoury chrism of blood and rice!—A.C.

⁸ "The nephew is offered as a substitute," Remban, p. 112. This rendering is not clear. It could never be the child of the murderer's wife's sister or of the murderer's brother: but always the child of one of his female blood relations. The point is that the substitute must be of the murderer's own tribe.

An offence against marriage law.	Pelēsir dua sa-kampung. ¹ Ēnau sa-batang dua sigai Mata tumbah tiada bērbēneh, ² Sumbang ka-pada tabat. Adat mēnuju ka-pada tauda. Bila " Sah " kata adat tiang. Janggal ta' boleh di-patoh lagi. Salah ta' boleh di-hukam : ³ Ia-itu suatu di-bēri, dua di-ambil.
Penalties of illicit love.	Tērkurong mati. Tērtanda bēratang.
Offences against public justice.	Kēpantangan adat. Di-lindung di-ēndapkan. Kēpējatian adat. Di-tērang di-bandingkan.
Custom fixes the heritage of each section of the com- munity.	Jalan raya, titian batu, Bukit bukan. ⁴ Rimba yang sunyi. Gang yang dalam. Lēpan yang lebar. Bandar yang sundai. ⁵ Si-barau-barau yang punya. Lubok dalam si-kitang-kitang yang punya. Gang guntong. Bukit bukan Waris dan pēnghulu yang punya. Sawah yang bērjinjang. Pinang yang gavu. ⁶ Nyir yang saka. Lēmbaga yang punya. Anak buah yang bērchalam. Ibu-bapa yang punya. Orang sēmanda yang gadoh bērsuarang. Anak buah yang punya. Lingkongan bēndul yang empat. Orang sēmanda yang punya. Jalan raya titian batu. Raja yang ēmpunya.

¹ This, like the next line, signifies union with another woman of the same tribe as one's wife during her life. "Rembau," p. 79 states that the offence is "classified together with the possession of a *pelēsir* as *pantang*";—the authors may have been thinking of some other saying, as our lines, which give the only version known in Jelebu and Johol, cannot be so construed.

² i.e. 'bastards.'

Two familiar spirits in one household,
 Two luhlers to one sugar-palm,
 Si'rounts without seed
 Are offences against morals.
 Custom looks for signs of guilt;
 When custom declares the offence proved,
 It is not a peccadillo to be mildly corrected.
 Nor can recourse be had to religious law—
 For this crime of taking two brides when a man has
 been given one.

Trapped with his mistress, the intriguer is done for;
 Leave his trace in her house and he will be fined.

It is forbidden by custom
 To conceal and abet.
 It is approved by custom
 To bring to light and compare facts.

The high way with its stepping stones,
 Hills and hill-bases,

Lonely forest,
 Deep ravines,
 Broad plains,
 Sloping water-courses
 Belong to the birds.

Deep pools
 To the fishes.
 Ravines and valleys,
 Hills and hill-bases
 Belong to the territorial tribe and their chief.
 Stretches of rice-field.

Old betel-nut palms,
 Ancestral cocoanuts
 Belong to the tribal headmen.
 Disputes among their families
 Are the province of the elders.
 When a husband disputes about the property acquired
 by his own and his wife's joint labour
 It is the province of his family.
 Within the four threshold-beams of his house
 Is a husband's province.
 The high road with its stepping stones
 Belongs to the king.

³ *Patoh* 'to press softly, firmly e.g. of binding thatching on to bamboo lathes; fig. to render submissive; *mimato* *orang jo luak nan elok* 'to bend a person to one's will gentleness is the best course'—Van der Toorn.

⁴ *Bukan* 'a hill base, land-locked basin, wide gorge' has been corrupted in Remban into *bakuan* 'mangrove' ('Remban,' p. 104 XVI).

⁵ 'Sloping'—Van der Toorn's 'Woordenboek.'

⁶ 'Old of persons and trees,' *id.*

	Jalan rayat titian batang Waris yang ĕmpunya. Jalan paya titian pĕrmatang. Lĕmbaga yang ĕmpunya.
It conserve- communal rights:	Ēmbun sa-titek di-lautkan. Tanah sa-buku di-gunongkan:— Yang dalam adat dan aturan.
and enjoins the care of property.	Padi ta' bĕrpagar lalang. Kĕrban ta' bĕrkandang sĕladang.
It lays down conditions of entail.	Pĕsaka Yang bĕrsĕsapan, ¹ yang bĕrjĕrami. Bĕrtunggul, bĕrpĕmarasan.
and for the transfer of entail.	Sah batal ka-pada sa-kadim: Kata bĕrchari ka-pada waris-nya: Tinggal waris mĕnongkat: Tinggal sa-kadim mĕlintang: Tinggal harta bĕrtuan ta' jadi: Tinggal tua batal. ²
Under the matriarchal system, males are elected to tribal offices.	Tĕrbĕt pĕsaka ka-pada saka; Si-laki-laki mĕnyandang pĕsaka: Si-pĕrĕmpuan yang punya pĕsaka. Orang sĕmanda yang mĕmbĕla.
An office never dies. Rules of election.	Patah tumbuh: hilang bĕrganti. ³ Ganti hidup bĕrkĕreŕlaan, Ganti mati bĕrkĕbulatan. ³ Kĕbulatan anak bĕlah mĕmbuat atau mĕmĕchat buapa: Buapa bulat, waris-nya rapat, mĕmbuat atau mĕmĕchat tua:

¹ *Sĕsapan* "abandoned land"—Adatrechtbundel VI, p. 406.

A Minangkabau saying runs:—

Sa-saso, sa-pĕrami,

Sa-ladang, sa-sawah,

Sa-hutan tingap, sa-hutan rendah,

Sa-pandan, sa-pĕrkuburan

—Willink, p. 381. Jelebu Malays explain the above saying as referring especially to graveyards; perhaps a reminiscence of the Minangkabau saw, which is no longer known in Jelebu. "Rembau" (p. 110 XXX) renders it "The waters of the pool and cataract are one"—a sentence unintelligible in the context and involving *bĕt* . . . a formative equally unintelligible here. For *sa-pandan* a N. S. variant is *bĕrpĕndam*.

² "Rembau" (p. 112, XXXIX) states that this saying is quoted "generally" in reference to the ceremony of adoption. In Jelebu and Johol, it is quoted very frequently in reference to alienation of *tanah pĕsaka* to one outside the tribe; but

The Sakai path with its tree-trunk bridges
Belongs to the tribe that owns the soil.

The path over the knolls in the swamps
Belongs to the tribal headmen.

We take the dew-drop and mix it with our sea;
We take the clod of earth and mix it in the mountain:
That is the arrangement of the custom.

Rice-crops unfenced become waste grass:
Buffaloes unpent become wild cattle.

Idle fallow, land with stubble,
Land with tree-stumps left by the feller,
Land that has been levelled—

These can be inherited, (—for they bear evidence of
occupation).

The woman's nearest of kin can approve or prevent:
The full members of the woman's tribe elect to find the
money:

If there are full members of her tribe, they can sub-
scribe to save the tail:

If there are next of kin, they can bar the sale:
If the property in question has an owner already, the
sale cannot proceed.

The tribal headman can quash the sale.

Our heritage comes from our women;
Men wear the insignia of hereditary office:

The inheritance belongs to the woman.

The man cherishes it.

What is broken, grows: what is lost replaced.

If a chief retires, he can suggest his successor.

If a chief dies, election by the common voice is re-
quired.

A family by common consent can elect or dismiss its
elder:

Elders by their common consent and with the support
of enfranchised members of the tribe can elect or
dismiss a tribal headman.

there, too, can refer to the preliminaries of adoption and of
substitution in the case of murder.

² In *adat* sayings, *saka* = "female line of descent," *baka*
"the male line."

³ Cf. Newbold's "Makkeen," II p. 107.

⁴ Other sayings are current in Johol and Jelebu:—

Ganti hidup, bérkēācharan,

Ganti mati, bérkēgulan,

which means that a *pēmangku* may be of the same *pérut* and
in fact the nominee of the retiring chief—provided the tribe
does not object; while on the death of a chief, the rotation
among the *pérut* must be observed:

Péchat hidup, bérkērdalan,

Péchat mati, bérkērapatan,

which has the same import.

	Kēbulatan tua, boleh mēmbuat atau mēmēchat undang; Undang bulat, lēmbaga rapat, waris sēdha, mēmbuat atau mēmēchat raja. ¹
Penalties for abuse of office.	Di-anjak layu, di-chabut mati. ² Kata adat dēngan pēsaka.
Conditions for retrobal.	Adat tidak mēlintang Hukum tidak mēngambek, Boleh sēmanda-mēmēmanda, Bila bērsēmanda di-mana-mana suku, Sah kata adat, Aver di-sank, ranting di-patah.
The married man serves his wife's tribe.	Orang sēmanda bērtēmpat sēmanda, Jika chēdek, tēman bērunlung; ³ Jika bodoh, di-suroh di-arah, Tinggi banir, ⁴ tēmpat bērlimlong, Rumbun dahan, tēmpat bērmang, Orang sēmanda pērgi karna suroh, Bērhenti karna tēgah.
which assess him accord- ing to his qualifica- tions.	Jikalau kita mēmērima orang sēmanda; Jikalau kuat di-budohkan di-bangkal kayu; Jikalau bingung di-suroh arah, Mēmēput nan jauh, mēngamponkan nan dēkat; Jikalau ia chēdek, hēndakkan mudugau; Jikalau maalim, hēndakkan doa-nya; Jikalau kaya, hēndakkan ēmas; Jikalau patah, pēnghalan ayau; Jikalau buta, pēnghēmbus lēsong; Jikalau pēkak, pēmbakar bērti.
	Masok ka-kandang kērbau mēngauak; Masok ka-kandang kambing mēmbehek, Bagai-mana adat tēmpat sēmanda di-pakar; Bila bun di-pajak, langit di-punjong, Bagai-mana adat nēgēri itu di-pakar, Orang sēmanda dēngan orang tēmpat sēmanda, Bagai mēmētumu dēngan duman; Mēnggolek pun luka, kēna golek pun luka.

¹ This last line contains a special reference to local Jelebu history. Jelebu, like Rembau, has the saying *Kayu tuda mēmbuat nēgēri dūa tuda boleh mēmbuatkan khēmpat, mēmbuatkan bērlimlong sabaga sēdha pēmakanan-nya*. "Rembau," p. 110 translates *khēmpat* "war levy," but why? In Arabic it means, "land-tax," and that fits the context exactly. In N. S. the phrase *khēmpat mati* is always used of "funeral expenses." *Bērlimlong* = "possessed of the powers of a justiciar."

² "Transplanted it (the custom) withers, uprooted it dies" (Rembau, p. 190, VIII.) The saying is also used of the dismissal of a chief from office, and of removing an offender from the path of evil or eradicating him from the tribe.

The tribal headmen by common consent can elect or dismiss a chief.

The chiefs by common consent and with the support of the tribal headmen can elect or dismiss the king.

What is transplanted withers, what is uprooted dies :
Is a saying of our hereditary custom.

When custom does not obstruct,

Nor religion prevent,

One can marry and give in marriage,

When a man marries into any tribe,

It is clear, says custom,

He becomes a drawer of water and hewer of wood.

When a man marries and goes to his wife's family,

He will be a friend in council, if clever ;

If foolish, he will be ordered about.

A tall man, he will be as a sheltering buttress ;

Prosperous he will be as a well-laden branch that gives shade

The married man must go, when he is bid

And halt, when he is forbid.

When we receive a man as a bridegroom,

If he is strong, he shall be our champion ;

If a fool, he will be ordered about

To invite guests distant and collect guests near ;

Clever and we'll invite his counsel ;

Learned and we'll ask his prayers ;

Rich and we'll use his gold ;

If lame, he shall scare chicken,

If blind, he shall pound the mortar,

If deaf, he shall fire our salutes,

If you enter a byre, low ;

If you enter a goat's pen, bleat ;

Follow the customs of your wife's family,

When you tread the soil of a country and live beneath its sky,

Follow the customs of that country,

A bridegroom among his bride's relations

Is like a cucumber among *durian* fruit ;

If he rolls against them, he is hurt,

And he is hurt, if they roll against him.

² = *menghambat*.

³ "If he is clever, I will try to cajole him" (Rembau, p. 116 XLV11). "Rembau" accepted this translation from Mr. Hale, who had excuse for rendering *tēman* "I," as he had been a Perak officer. *Tēman* is a Perak and not a N. S. word for "I," and *bērandang* does not mean "cajole."

⁴ *Tamag bama* and *rimbau dahau* do not necessarily imply one and the same person ("Rembau," p. 117 XLV11); they contrast the strong man and the rich man.

The
marriage
contract.

Bila dapat di-orang sēmanda
Di-bawa ka-tēmpat sēmanda.
Bila dapat di-tēmpat sēmanda
Di-bawa ka-orang sēmanda.

Bila sah sa-kata,
Tanda di-tērima.
Di-kēmbangkan dari sa-orang ka-sa-orang
Ia-itu sa-bēntok chinchin bērtanya.
Kalan sah sa-kata
Kata di-kēmbalikan:
Kalan ta' sah sa-kata.
Tanda di-kēmbalikan

di-dalam tujuh hari: sa-lambat-lambat-nya dua kali tujuh
hari.

Chinchin mēnantikan adat
karna

Orang bērbini bērkēlanja.
Orang bērchēran bērkēsudahan.
Orang bēranak bērupah bidan.
Orang nikah dēngan mahar-nya
Adat di-isi, janji di-laboh.
Sah kata adat mansiang.
Chachat chēdēra di-kēmbalikan.
Sawan gula luar janji.
Elah si laki-laki lunchur.
Elah si-pērēmpuan ganda.

When a lad's folk have found a girl,
 They bring the matter to her relations.
 When a girl's folk have found a lad,
 They bring the matter to his relations.
 When the pact is made,
 A token is accepted,
 And the news spread from neighbour to neighbour,
 The news of the ring token,
 If the pact is made,
 Word thereof is sent back :
 If the pact falls through,
 The token is sent back
 within seven days, or at the latest days twice seven.
 And the ring sent as token
 Remains till the bride-fee is paid.

For

The married state involves maintenance
 And divorce settlement,
 And birth a midwife's fee,
 And marriage the bride-fee
 Bride-fee paid, the pact is made fast ;
 But the law of nature ordains
 That the fee may be returned
 If there is flaw or blemish in the bride.
 Epilepsy and lunacy annul the pact.
 If the groom break his troth, the bride-fee is forfeit.
 If the bride break her troth, it must be repaid two-fold.

His wife's
tribe con-
trols and
protects him
in business.

Kusut mēnyēlōsaikan.
Chichir mēmungut, hilang mēnchari,
Utang mēmbayar, piutang mēnērimakan
Oleh tēmpat sēmanda.

Bride-
grooms
differ in
type.

Pertama orang sēmanda sahaja,
Kedua orang sēmanda bapa budak,
Ketiga orang sēmanda langau ija.
Keempat orang sēmanda kumbang jantan.
Kelima orang sēmanda alas tēmpat sēmanda.

Custom has
fixed rules
for division
of property
on divorce.

Chari bahagi.¹
Dapatan tinggal.
Pembawa kēmbali.
Kutu di-belah.
Suarang² di-ageh.
Ruzi laba pulang ka-tēmpat sēmanda.
Nyawa darah pulang ka-pada waris.

The educa-
tion of
children.

Bila mēngadakan anak,
Kalau laki-laki, di-sērah mēngaji;
Kalau pērēmpuan, di-sērah mēnjahit.
Masa itu tērhutang-lah orang sēmanda.
Pētang mēngandangkan.
Pagi mēlēpaskan:

until
marriage.

Di-jaga avam.
Jangan di-makan musang.
Kerban jangan mērompak.
Bila baligh anak itu.
Yang pērēmpuan masa-masa-nya di-nanti-nantikan.
Masa-masa-nya di-adang-adangkan untong-nya.
Yang laki-laki masa-masa-nya di-chari-charikan.
Masa-masa-nya di-adang-adangkan untong-nya:
Ia-itu
Ganut yang bērkēchapi
Risik yang bērdasus³
(Sa-umpama barang kali ada yang bērhajat yang mēm-
bēh-nya.)

¹ Some interpreters distinguish this line from the fifth as our translation does; others explain that *chari* refers to land and *suarang* to other property. I think there is little doubt that the first line is a N. S. paraphrase for the Minangkabau terms of the fifth line, and that the two lines are identical and refer to joint earnings of husband and wife. Line 5 always takes the place of line 1 in real Minangkabau *pēpatah* and line 1 does not occur. ² Cf. note 1, p. 39. "Rembau" reads *bēr-suarangan*, obviously corrupt, because *bēr* *an* is a plural formative and *sa--a* singular and their conjunction unthinkable; *pērsuarangan* is a Minangkabau form common in N. S. Jelebu pundits take *kutu* to mean 'lice' and the phrase *kutu di-belah* to imply that even the parasites on the persons of those seeking a divorce must be split in half, presumably a last occasion

To unravel disputes,
 To pick up the fallen and search for the lost,
 To pay debts and receive dues
 Is the business of a man's wife's family.

Sons-in-law are of five kinds,
 First the mere son-in-law;
 Secondly the father of children for the tribe;
 Thirdly the green fly that leaves his sting (and deserts
 his pregnant mate),
 Fourthly the bee that sips from every flower,
 Fifthly the bulwark of his wife's relations.

Earnings by husband or wife during marriage are
 given to him or her who has earned them;
 What a man has got by his wife remains with her tribe;
 What the husband brought goes back to him;
 Property in partnership is split up;
 The common property acquired by a man and wife's
 joint labour is equally divided;
 Any loss or profit on the wife's estate is a matter
 for her tribe
 The man's person is restored to his own tribe.

When we get children,
 Boys must be set to learn their letters
 Girls must be set to sew,
 At that time it is the duty of the mother's relations
 To gather the children to the fold in the evening
 And to let them loose in the morning.
 They must guard the chicks
 Lest the civet devour them;
 They must keep the young buffaloes from prowling.
 And when the children come to years of discretion,
 The girls will be sometimes awaited
 And sometimes will be hawked about as brides
 And the boys sometimes will be sought in marriage,
 And sometimes will be hawked about as suitors.
 And then
 There will be fingers twitching
 And lips whispering over the bargain
 As when perchance folk have set their hearts on a
 purchase.

of familiarity! Willink (p. 629) found Sumatran pundits taking the same view. "Rembau," p. 114 translates "while at one, share alike," an impossible rendering because *bēlah* = 'divide,' not 'share.' Our translation is that of Johol and of Dutch scholars.

³ Humphreys reads *bērlusus* (Journal 72, p. 30) but *bērl-dasus* is the form used in Jelebu and Johol and seems to be correct: *vide* Van der Toorn.

Some Lexicographical Notes, From the Dutch.

BY R. O. WINSTEDT.

Of late years the Dutch Government has published many of its journals on Medicine and Agriculture in English as well as Dutch, and recently a *Year-Book of the Netherlands East Indies, 1916*. It is a pity that cost will probably preclude private societies from following this example, or British students would have a better chance to become acquainted with the abundant fruits of Dutch scholarship. In this paper I propose to invite attention to notes on the derivation and meaning of some Malay words printed in the *Bijdragen tot de Taal-, Land- en Volkenkunde van Nederlandsch-Indië, uitgegeven door het Koninklijk Instituut*.

Deel LIV, 1902 p. 311-312 contains a note by H. Kern, pointing out that the Malay word *bēdil* is derived from the Tamil *vedil* or *vediyal* 'explosion of gun-powder':—cf. *vediluppu* 'saltpetre' with the Batak *sira bodil* 'saltpetre.' For the change from *v* to *b* one may compare *Bēlanda* from *Wolanda*. For the change in the accent from the penultimate to the final syllable, one may compare the Malay *pēti* with the Tamil *petli*, the Malay *kēdai* with the Tamil *kadai*. Where the paroxytone is retained, as in Tamil, then the indeterminate vowel is not found:—Tamil *s'atai* 'meat,' Malay *sātui*, Javanese *sate*.

In *Deel LV* pp. 50-52, Dr. Ph. S. van Ronkel has a paper on the derivation of *satai* and other Malay words from the Tamil—*bagai, ragam, sēgala, badai, jodo, kodi, patam, mētērai*

On p. 483 *Deel LVIII., derde en vierde Aflevering* (1905) the same writer has a short paper on "*Kuda Sēmbērani*."

Klinkert interpreted the word *sēmbērani* as *sēm + bērani* 'fiery, spirited.' Pijnappel derived it from the Sanskrit *suwarna* 'bright coloured,' for which Riau-Johore Malay has *sēmburna* and Kedah *sēmbawarna*. Prof. Kern thought it might be from *sauparni* or *sau-parneya*, "offspring of Suparna" one of the names of Garuda. Lexicographers have translated the word 'a mythical breed of horse,' 'winged steed,' 'a Pegasus.'

Two forms of it are found: *sēmbērani* and *sēmburani*. In the *Hikayat Raja-Raja Pasai* (J. R. A. S., S. B. No. 66, p. 32) occur
Jour. Straits Branch R. A. Soc., No. 78.

the phrases *kuda sēmbērani*, *anak kuda Parasi* and *kuda galak kēlabu sēmbērani anak kuda Parasi*:—The Romanizer has wrongly put *kēlabu* for *galak* and *Pērasī* for *Parasi*, it should be noted. The horse is one that *tiada pēnah di-kandurau manusia* "has never been ridden by man." The passage makes it clear that reference is not to a mythical steed but to an unbroken horse, of mixed breed: '*anak Parasi*' = 'having a Persian sire' only, while pure Persian would be simply *kuda Parasi*. *Pārasi* is the Tamil form of 'Persian', while the usual Malay form is disyllabic *Parsi*. *Kēlabu* 'ash-grey' describes generally the colour of mouse or wolf, but van Ronkel thinks it may perhaps be used of 'bay' horses. A half-breed Persian horse would be quite likely in the Malay archipelago: certainly horses were imported from India: even the word *kuda* is the Sanskrit *ghoṭi* in its Deccan form *koda*.

Now in Tamil 'bay' red is *cēm*:—*cēmbudai* 'red hair,' *cēmbalam* 'yellowish fruits,' *cēmvari* 'red short-haired sheep.' Again there are two Tamil words *puram* and *purani* both meaning 'the outside, bark, hide.' *Cēm* = *purani* would properly become *cēmburani* = *sēmburani* = *sēmbērani*; and the word would mean 'with reddish hide, bay.' Perhaps the word occurs for the first time in this passage from the "Chronicles of Pasai;" if so, the unusual Tamil form *Parasi* would lead us to expect almost any other unusual word in the sentence to have a Tamil form. Professor van Ronkel's interpretation seems very plausible.

In *Deel LXVI* the late Professor Ch. A. van Ophuijsen has published lexicographical notes elicited by the appearance of Klinkert's *Nieuw Maleisch-Nederlandsch Zakwoordenboek* in 1910. It is too long an article for me to notice any but a few points here. He remarks that in the *Sējarah Mēlahu* we have a meaning of *nagara* 'hill-top' (*naga* 'hill,' *agra* 'top') which has escaped lexicographers:—*di-ikut baginda ka-atas bukit, bērlēmū di-nagara bukit itu*. He surmises that *palusi* is derived from the Sk. *vidushi* 'wise,' and *pēridi* from the Sk. *priddhi* 'growth, increase.' He points out that in Minangkabau *kain ainu'-banat* becomes *kain Indabanat*, and *Inda* = *Indēra* and suggests that it is a fabric labelled with the name of some place like *Indēravanat*. The whole paper is valuable to the lexicographer and corrects many errors of Klinkert, even if some of the derivations suggested for words may be doubtful.

On p. 122 *Deel 68, derde Aftoering* (1913) G. P. Rouffaer discusses the derivation of the words *kachi*, *chēngkurai* and *chindai*. Klinkert interpreted *kain kachi* = 'fine shirting,' and *chaul* he derived from the Persian *sal* and *muri* from "moiré" and *Bēlati* from *bērhali*! Prof. Kern (*Bijl. Kon. Inst.* 7, I p. 442) pointed out in 1903 that Malay *chaul* and old Javanese *chawēli* were derived really from the Indian trading port "Chaul." Wilkinson derived *Bēlati* from the Skr. *vilagati*, apparently printing "Skr." by a slip for "Arabic," the Arabic being *wilayati*, *walayti* "of the motherland" and thence "European." Malay *muri* = *muriis* = *molis* = Jav. *mori* "white calico."

Rouffaer points out that the Arabic long *i* is suffixed often to names of places to form adjectives.

Malay *Bêrochi* = Bharochi = (silk) from Bharoch (Broach).

.. *Sêlampuri* = Sêrampuri = (blue cotton) from Sêrampore.

.. *Surati* = (Cotton) from Surat.

.. *Kachi* = (White cotton) from Cutch.

Rouffaer expresses wonder that Klinkert had not consulted Wilkinson's Dictionary for the derivations of *Bêlahi* and *Kachi*.

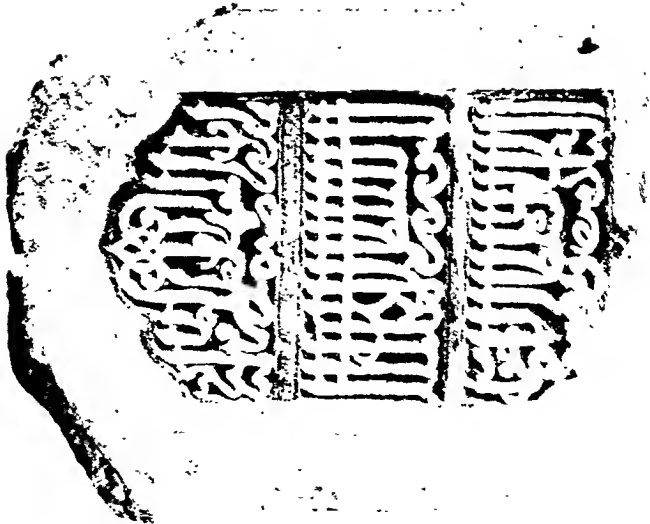
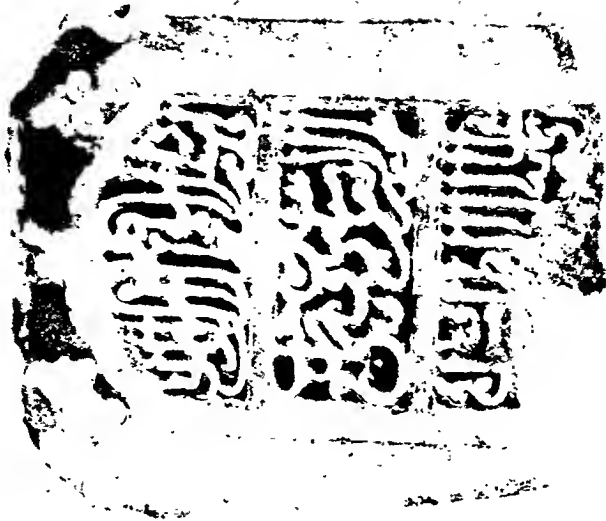
So many Malay words for fabrics are geographical. *Kain Kêmbayat* 'cloth from Cambay'; *kain Pêlekai* 'cloth from Pakkat*'; *kain Chêmpa* 'cloth from Champa.' Rouffaer would derive *Chêngkurai* from an Arab pronunciation of Singgora:—

Sênggora-i = *Chêngkurai* = *Chêngkurai*

Von de Wall interpreted *kain chindai* = 'a patterned silk fabric from Surat.' The *Livro* of Duarte Barbosa, published in 1516, quotes the word as *chande* and translates it "large silk mantillas worn by the women of Gujerat." Rouffaer claims that *Chindai* means "from Sind," through the Javuese form *Chinde*; *Chindai* he considers a bastard corruption of the older Javanese form, a corruption for which he finds parallels in certain place-names—Mal. *Katai* = Jav. *Kute* = Sk. *Koti*; Mal. *Brunai* = Old-Jav. *Burue* (*ug*). But Prot. Kern did not accept this derivation of *chindai* as proved beyond question.

Kain Pêlekai, kain Chaul,
Sama-sama kita ampakan
Adik bérmat, abang bércaul
Sama-sama kita sampakan

Pantun Melayu 188, p. 51.



TOMBSTONE OF SULTAN MANSUR.



TOMBSTONE OF SULTAN MANSUR.

The Tomb of Mansur Shah, Sultan of Malacca, 1459—? 1475 A. D.

BY R. O. WINSTEDT.

(With two plates)

When I was last in Europe, Mr. Blagden gave me a transcript of the inscription on a tomb purporting to be that of Sultan Mansur Shah, one of the rulers of Malacca before the advent of the Portuguese. Mr. Hervey had got two the inscriptions transcribed and had told Mr. Blagden that the tomb still existed. Mr. Blagden asked me if I could trace it. On a visit to Malacca, I found the two stones of the tomb placed against the wall of the Residency: Mr. Wolferstan kindly arranged for them to be photographed and undertook to take steps for their preservation. The photographs have been reproduced for its Journal.

An account of Sultan Mansur Shah's reign will be found on pp. 24-26 of Wilkinson's "History, Part I" in the "Papers on Malay Subjects" (F. M. S. Govt. Press, Kuala Lumpur).

According to Hervey's version, the inscription of the face at the bottom (or left) of Plate I should be deciphered as follows:—

"Hadza randzat al-mukaddasat wa'l-daulat al-tamih, al-mulharat al-Sultan al-munawar al-adil al-malik al-badzil al-Sultan al-marhum Mansur Shah, kad entakala min dar al-mahal ila dar al-wirad yaum al-arbaa sanat dha Rajab wa thamanin wa thaman mi'ah."

The translation is.

"This is the tomb of the illustrious high and righteous glorious and just Sultan, the beneficent prince, the ruler loved of God, Mansur Shah. He departed this mortal abode for the abode of bliss on Wednesday, the second day of the month of Rejab in the year of the Hegira 880."

The inscription on the two edges of the tomb is as follows— which means

"Al-asma' al-dufana' al-Sultan al-Ali"

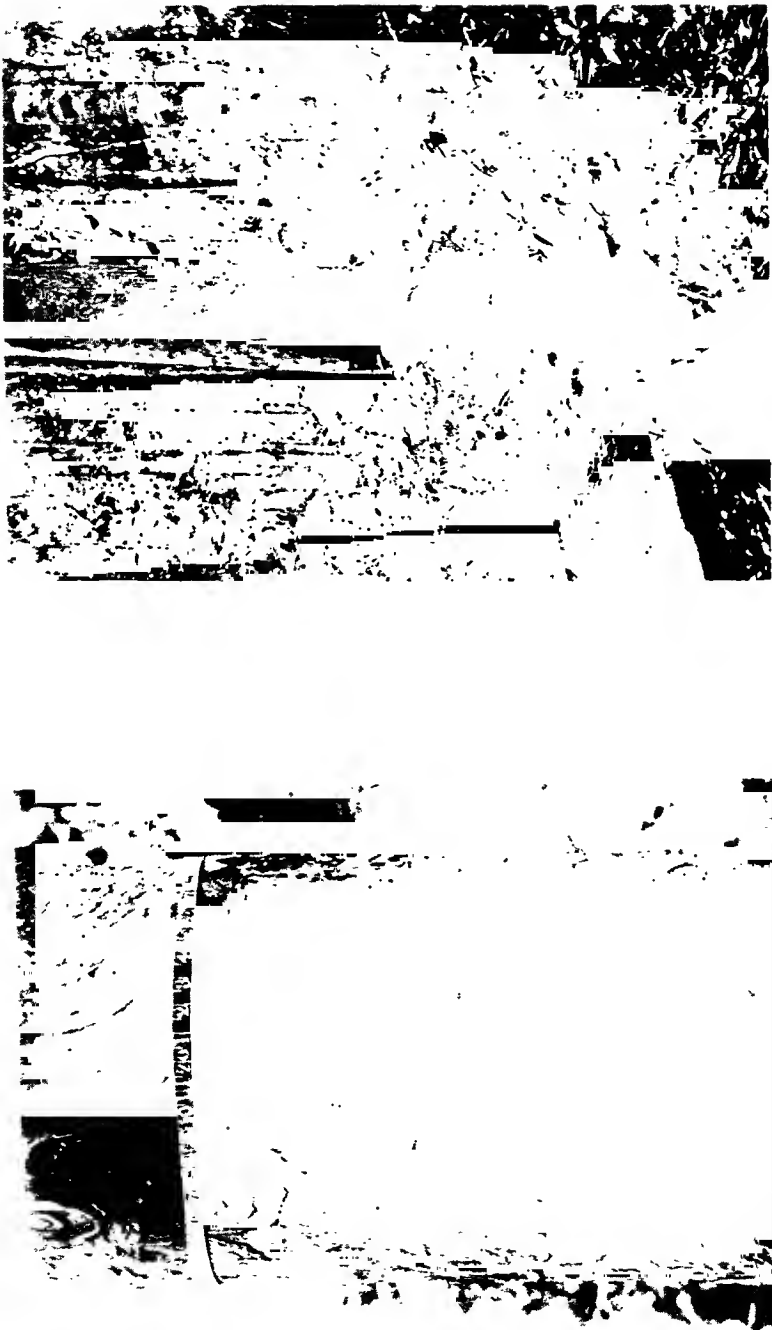
"The name of the deceased, the most exalted Sultan."

The 2nd of Rējab 880 A.H. = Wednesday, Nov. 1, 1475 A.D. But unfortunately the bottom line of the inscription would seem to have been chipped and damaged since Hervey's day. If the date is correct, the tomb will be the oldest known relic in Malacca, perhaps with the exception of the Hindu *makara* at the foot of the Residency hill.

It is fair to add that a local Arab pundit to whom photos of the tomb were submitted could not make the above version out of the inscription and failed to give an intelligible interpretation. It would require a scholar acquainted with the carved Arabic script of that period to give a final interpretation: possibly Hervey got his version from such a scholar but there is no record. The hole in the other stone finds a parallel in the hole of the Pengkalan Kempas tomb.



GORDONIA CONCENTRICATRIX, BURKILL.



Photos by J. G. WATSON.

Gordonia concentricatrix. Burkill,
(Kelat samak, Samak pulut, Kelat merah—Malay)

By G. E. S. CUBITT.

(With one plate)

This new species, of which a botanical description was published in pages 152 and 153 of No. 76 of the Society's Journal, is illustrated in the frontispiece. It is a large evergreen tree attaining a height of over 100 feet with a maximum girth so far recorded of $8\frac{1}{2}$ feet at $4\frac{1}{2}$ feet from the ground. The stem is cylindrical and slightly thickened at the base, but not buttressed. The bark has been variously described as light brown, reddish brown, and fawn-coloured, and peels off in flakes a foot or more in length and an inch to three inches wide, the peeling usually being from below upwards. The flakes in falling leave a light terra-cotta coloured smooth new bark, marked with lozenge-shaped concentric scars resembling a contour map. The scars are not always as conspicuous as those shown in the plate, but are always perfectly evident, and can at any time be exposed by removing the loose bark. The scars are also clearly visible on the inside of the old bark, but tend to disappear with age on the outside. The bark, when cut or wounded, exudes a dark blood red or crimson sticky juice, which turns black on drying. Below the bark the blaze is white. The crown is fairly open.

It is not unlikely that the tree flowers and fruits twice yearly, the fruit taking about 6 months to ripen. In Selangor on the 21st May, 1917, the tree was in full flower; on the 31st May, 1916, the stamens had fallen, and the fruit was just beginning to form; in June, 1916, ripe capsules were collected; in July, 1917, old fallen fruit was found on the ground; in October, 1917, the fruit of the flowering of the previous May had not yet ripened. In Pahang the tree is said to flower in December and January; in August, 1917, neither flower nor fruit was obtainable.

Gordonia concentricatrix is somewhat uncommon but is widely distributed, being recorded from Malacca and the Dindings, as well as from Selangor and Pahang. So far as is known at present it grows only at low elevations, probably not above 1000'. In the Rantau Panjang Reserve in Selangor it occurs over a small area in large numbers, 25 trees from 15" to $8\frac{1}{2}$ ' (average 41") in girth at breast height having been counted on two acres. This is however exceptional and, elsewhere it occurs sporadically. Its chief associates in the Rantau Panjang Reserve, where the soil is a loam,

are *Ochanostachys amentacea* and various species of *Shorea*, with *Eugeissonia tristis* in the under-growth. In the Bangi Reserve in Selangor it is found with Kelat Merah (*Eugenia* sp.), and its resemblance to this tree no doubt accounts for its being known to some Malays by the same name. The *Eugenia* bark is similar in colour to that of the *Gordonia*, but does not peel off in the same long flakes. The *Eugenia* also has scars on the new bark, but they are not very conspicuous and are wavy rather than concentric. Finally the blaze of the *Eugenia* is quite dry.

Gordonia concentricatrix yields a tough close-grained pinkish to red-brown timber somewhat lighter than water and said by the Malays to be suitable for house-building. The bark is used in Pahang for dyeing fishing nets and clothing for rough use, cloth treated three times with the dye becoming, so it is said, fairly waterproof.

The following corrections should be made in the botanical description already to referred to:—

- (i) Under figures 10 and 11 "Abdul Rawi" should read "Abdul Rani."
- (ii) Under figure 11 "898" should read "878."
- (iii) In the particulars of occurrence the sentence "ex Selangor.....et cum fructibus" should read "ex Selangor ad Rantan Paujang collegerunt sub numero C. F. 878 J. G. Watson et Abdul Rani mense Maio cum floribus et mense Junio cum fructibus."



English Tombs and Monuments in Bencoolen.

By C. J. BROOKS.

(With three plates).

Bencoolen, as an early English settlement in the East, may lay claim to more than passing interest from the historian of English pioneer colonisation, and to the naturalist, as a centre where early researches were made, in a country of which the fauna and flora are but still incompletely known, and whose vast forests are yet unexplored.

It was in connection with the latter that the writer's attention was drawn to the old English tombs in Bencoolen while seeking the burial place of Joseph Arnold, the discoverer of the *Rafflesia*, and that of William Jack, the author of *Malayan Miscellanies*, both were presumably buried there¹. Neither can be located, possibly they are among the majority whose tombs bear no inscription, together with Sir T. S. Raffles' son and Capt. Auber, both mentioned in Jack's letters to Wallich as dying during this period in Bencoolen², while that of Jn. Lancaster, Surgeon³, is in evidence.

They may however rest in some forgotten spot, perhaps adjoining the old Residency, where ever it was, for interments were not confined to the burial ground, although in existence at the time, and the earliest inscribed grave bears the date 1775, but are somewhat scattered at least those of the governing class. For instance Capt. Hamilton's tomb is even now on the outskirts of the town while others are in Fort Marlboro, and the site of Governor Watts' is unknown.

In this record it has been assumed that old tombs bearing no inscription belong to the period under consideration, at the same time it must be admitted there is little justification for doing so; in either case it is difficult to understand why so many tombs bear no inscription, 46 in a total of 73. In nearly every instance a recess exists for the insertion of a tablet, possibly some have been stolen, but in many cases the sides are so smooth that it is unlikely one was ever inserted.

Magnificent casuarinas and crotons give a picturesque effect, and lend a solemn shade during the hot hours of the day. The tombs are well tended as far as the removal of vegetation and whitewashing is concerned, many show large cracks in the masonry probably

1	Jack's letters to Wallich, vide introduction	This Journal No. 73
		page 147 and 239
2	" " " " " " " "	" 234
3	" " " " " " " "	" 237

due to earthquake. It is still the burial place of Benkoelen, but in the accompanying plan only the locations of the English tombs are indicated, with a few exceptions which are not mentioned in the text.

The author's thanks are due to Mr. Westenck, the Resident of Benkoelen, Mr. van den Horst, and Mr. P. Jansen, T. Pzn., for assistance in compiling these notes.

TOMBS IN FORT MARLBOROUGH.

To the right on entering the barbican and below the barbette, are three altar tombs, side by side, each surmounted by a massive slate slab. The inscriptions are now illegible with the exception of the names and a few words in No. 1 and 2, and entirely in the case of No. 3.

No. 1 (Near the barbette)

Charles Murray Esq.
Assist. Residt. Ft. Marlboro., 1807.

2 Thomas Parr Esq.

The inscriptions are long and both terminate with the name of Lord Minto. In one case it seems that it was erected to his order, this would then follow for the other.

THE MONUMENT TO RESIDENT PARR.

This handsome monument, a well proportioned domed pavilion, stands by itself in a small grass square in the busiest part of the town, at the top of the main Pasar adjoining the recreation ground.

There is no inscription indicating the purpose for which it was erected, and at the present time the inhabitants both European and Native are almost entirely ignorant of its origin.

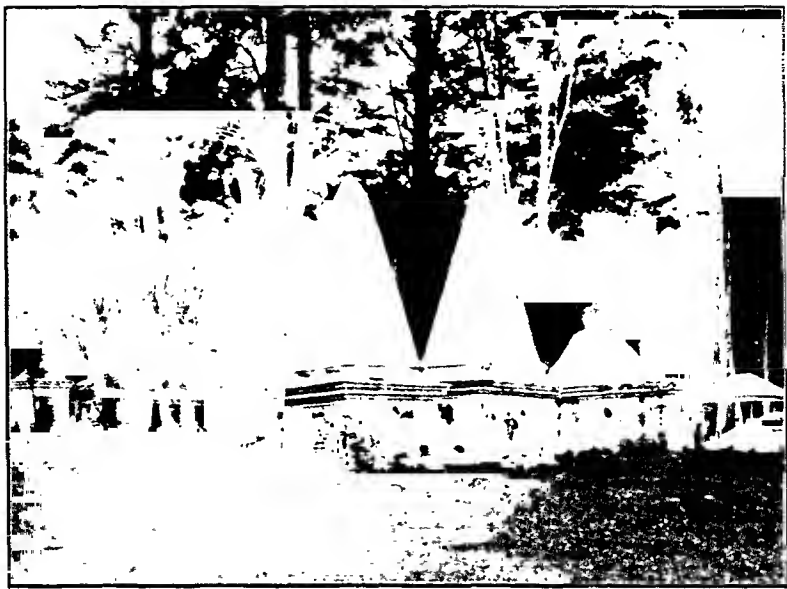
Resident Parr was murdered by the natives in 1805.

The condition of affairs preceding the tragedy, and later the revenge taken by the Government on the natives is described in Nahny's Letters, and Lady Raffles's Memoir. (vide, *Onze Indische Financien*, by E. de Waal, p. 8 & 9.) of which the following is a brief summary:—

The business of the East India Company was essentially in pepper, and to insure the largest profits against the lowest prices only elementary agreements were made with the head natives.

The Governor and other functionaries were allowed to trade on their own account, especially in the importation of opium and piece goods to Java.

The total trade of the port at this time was worth about £100,000 per annum, while the Company's trade in pepper was declining, they—the Company—decided to economise.



OLD BRITISH TOMBS IN BENCOOLEN.

In 1801 under the Governor-General Lord Wellesley a commissioner was sent from the High Court of Bengal to Bencoolen with authority to suspend the Governor and his two councillors and reduce the number of functionaries, prohibit private trading, and reduce the Settlement to a dependency of Bengal.

It appears that the commission was executed in a tactless manner. The garrison of Fort Marlboro was assembled in arms and the commission read in public.

A considerable outcry resulted from this insult, some of the dismissed received compensation, while others were dismissed without pay and being bound to the place became impoverished. These conditions caused great discontent which was increased among the natives by the action of Resident Parr, who was sent from Bengal to succeed the late Governor.

He proceeded to reform the native administration of justice without consulting the native chiefs, assuming a despotic power over them. To the cultivation of pepper he added coffee and made both compulsory.

Moreover being used in his former position in Bengal to absolute obedience he personally insulted many of the most important natives.

Before long a conspiracy against his life was deliberated, this was known but Parr although warned would pay no attention.

On a determined night his house at Mt. Felix—some three miles south of the Fort—was attacked by a band of natives who overpowered the guard, then entered the room where Parr lay ill and decapitated him, in an attempt to defend him his wife and secretary Murray were wounded, but no attempt was made on their lives nor on the lives of other inhabitants of Bencoolen.

The attack was a personal matter.

The action of the Government relative to this is described in Lady Raffles's Memoir:—

The measures that followed were of a doubtful cast.

As soon as it was discovered that the designs of the people were confined to the assassination, and not directed against the settlement generally, search was made for the perpetrators of the act. Rewards were offered for the apprehension, alive or dead, of the assassins.

It was thought unsafe to touch the chiefs. Several of the people were blown from the mouths of guns. As the danger diminished, the spirit of indignation and revenge seemed to have increased. An order was given to burn and destroy every village within a certain distance, and the work of de-

vastation was carried on as if it were intended to place the future security of the settlement in surrounding it with a desert. The fruit-trees, venerable by their age, that surround a Malay village, are the protecting deities of the place, and are regarded with reverence and respect: Their destruction is looked upon as little less than sacrilege: Yet the axe was laid to their roots, and what ever could shelter or protection was levelled with the ground, and the whole population of the suspected villages turned loose upon the country.

To retain this in the memory of the people a handsome monument was erected by the natives to the order of the Government, in honor of Parr.

It serves now as an ornament to the town, and a very suitable shelter to President Watts tombstone, the original site of this stone is now unknown. It leans against the inner wall, a massive granite slab, artistically inscribed as follows:—

Richard Watts Esq.

Sometime of Council for the Rt. Honble Compas Affairs
in Fort St. George.

And in the year 1699 came over Deputy Governor of this Place.

And in about three years after made by Commission from the
Company the first President of this Coast.

In which station he departed this life December 17, 1705.

And in the 44 year of his age.

THE OBELISK TO CAPT. HAMILTON.

This stands in the junction of three roads, some little distance south of the town, and at the end of the Pasar Baroe Road.

A slate tablet bears the following inscription:—

Underneath this obelisk are interred the Remains of Capt.
Robert Hamilton.

Who died on the 15th Dec., 1793. At the age of 38 years.

In command of the troops and second member of the Government.

THE CEMETERY, BENCOCOLEN.

The numbers are those recorded in the Government register and plan, only those of English or early origin are mentioned in this record: All have monuments.

Division 1.

No.

12 Majr. Chas. Porteous

2nd Br. 20th Regt. B. N. I.

8 April 1816. Age 39

(A fine monument)



OLD BRITISH TOMBS IN BENCOCOLEN.

The moral qualities which graced his mind,
 Proved him an ornament to human kind,
 Society his manners so adorned
 He lived respected, died sincerely mourned.
 Oh pass not by, stop youthful pilgrim here,
 Read this and on his ashes drop a tear.

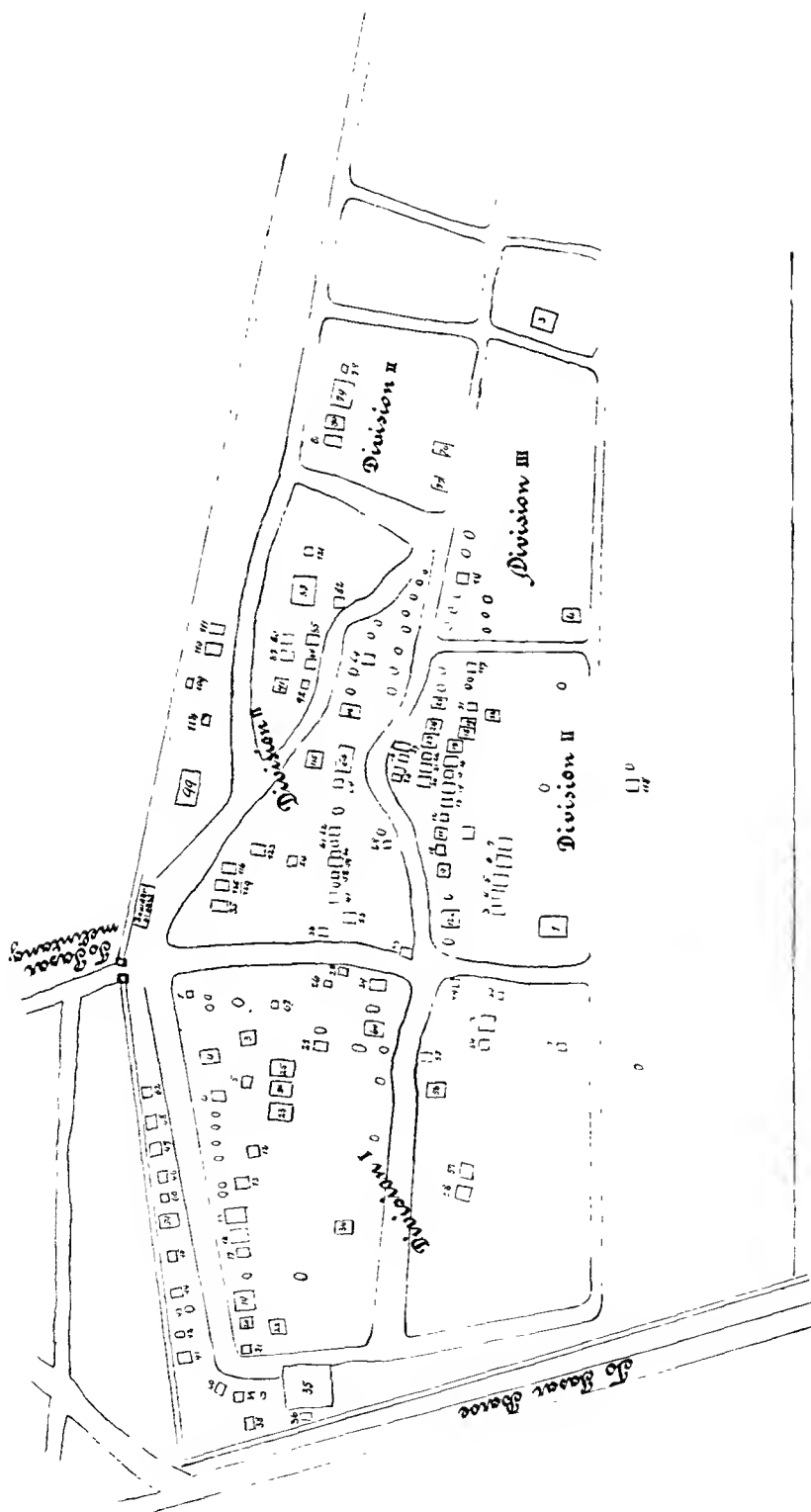
(A fine monument)

- 57 Mr. Thos. Whittenberry
 28th Aug. 1802, Age 18 years
 58 Ed. Atkins Esq.
 28th March 1812, Age 46

Division 2.

No.

- 1 A large square tomb with side tablets,
 Ann. H. Johnstone
 Christened 17th April, 1790 Died June,
 Wm. Cox
 1802-1804
 Ph. Cox
 May 1804 July 1804
 3 No inscription.
 4 T. W. Gibson
 1862, Age 56
 5 No inscription.
 6 "
 7 "
 12 "
 to "
 27 "
 31 "
 38 Ed. Crisp
 Writer in the service of the E. I. Company.
 24 Dec. 1796
 53 Capt. Thos. C. Tapson
 15 July 1816, Age 52
 This humble monument was erected to his memory
 by his much afflicted friend Noah Jessmina.
 54 Miss Frances Maclane
 18 Oct. 1858, Age 58
 59 No inscription. Old tombs of various types.
 60 "
 61 "



The Cemetery, Penang.
Showing early Egyptian tombs.

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On a Serow from Annam.

BY DR. R. HANITSCH,

Director, Raffles Museum, Singapore

(With two plates.)

Two French gentlemen, Monsieur Louis Chochoy and Monsieur Gabriel Saint-Poulof, of Quinhon, Annam, presented last year (1917) to the Raffles Museum the skin and skeleton of a Goat-Antelope or Serow, together with the photographs of the living animal, careful measurements and an account of its capture and of its behaviour in captivity.

The animal had been picked up in the sea by native fishermen on the morning of February 5th, 1917, off the peninsula of Phu'ong Mai (lat. about $13^{\circ} 30' N$) in Annam, having apparently fallen from the high cliffs there. Monsieur Toulouse, Commissioner of Police, was the first to hear of it and informed M. Chochoy and M. Saint-Poulof of this strange occurrence. They hastened to the spot and found the animal alive, tied to a tree and surrounded by gaping Annamites. The animal was uninjured, but seemed much frightened and pulled hard on the rope. It allowed itself to be touched and to be caressed, though all the same its eyes were rolling for terror. Once it pulled so hard that its feet slipped, causing it to fall heavily to the ground.

M. Saint-Poulof bought the animal from its captors, placed it on a cart and took it to his house where he photographed it. It continued to make desperate efforts to get free from the rope. It drank readily, but refused to feed although it was offered leaves and grass from the hills specially gathered for its benefit, and died three days after.

The natives knew nothing definite about the haunts and the distribution of this animal. They said it lived in the mountains and moved about at night time only; they affirmed that it was rare and that only woodcutters and charcoal burners occasionally met with it. They regarded its flesh as edible, though it brought ill luck to those who ate it. The horns were said to have wonderful medicinal properties, and the Chinese apothecaries pay high prices for them for treating nervous diseases.

The Annamite name of the animal is "con dê nui" which really signifies "wild horse." The French of Indo-China, however, call it "meufilon," and French sportsmen state that it occurs along the coast of central Annam, on a small island opposite Tourane,

called "He aux montflons," also on the islands of the Bay of Along and in the neighbourhood of Ninh-Binh, Tonkin. (The Bay of Along and Ninh-Binh lie due East and South-East of Hanoi respectively).

The occurrence of a "Wild Goat," or more correctly, of a "Goat-Antelope" or "Serow," in South-Eastern Asia has been known for more than a hundred years. The first description of a Serow is by William Marsden, who in his "History of Sumatra," 1st edition, 1783, p. 93, says:

"Goat: *Cambing*. Beside the domestic species, which is in general small, and of light brown color, there is the *cambing ootan*, or goat of the woods. One which I saw was three feet in height, and four feet in length of the body. It had something of the gazelle in its appearance and, excepting the horns, which were about six inches long, and turned back with an arch, it did not much resemble the common goat. The hinder parts were shaped like those of a bear, the rump sloping round off from the back. The tail was very small, and ended in a point. The legs clumsy. The hair, along the ridge of the back, rising coarse and strong, almost like bristles. No beard. Over the shoulder was a large spreading tuft of greivish hair: the rest of the hair black throughout. The scrotum globular. Its disposition seemed wild and fierce, and it is said by the natives to be remarkably swift." Bechstein, in his "Allgemeine Übersicht der vierfussigen Thiere," 1799, Vol. I, p. 98, based upon this description his *Antelope sumatrensis*, and Raffles (Transactions, Linnean Society, Vol. XIII (1822), p. 266) and others corroborated the occurrence of a Serow in Sumatra. Raffles says that he kept one for months, but found it impossible to tame it, and that it finally died from impatience of confinement.

The Raffles Museum has one specimen of a Serow from Sumatra, obtained at Lebong Tandai, near Benkoelen, and presented in August of last year (1917) by Messrs. P. Jansen T. Pzn and C. J. Brooks. According to Mr. Brooks the animal seems to be common in the neighbourhood, as he once saw a number of Serow skins at a native auction at Tijroep. This Sumatran form appears by Blanford, Lydekker, S. S. Flower, Butler, Rowland Ward and others under the name of *Nemorhadus sumatrensis*, though Pocock has since shown that it should be known as *Capricornis sumatrensis*. (See his papers in A. M. N. H. (8) Vol. I, pp. 183-188, and P. Z. S. 1908, pp. 173-202).

To Dr. N. Wallich who had so many connections with Singapore, belongs the honor of having exhibited before the Zoological Society, London, the first specimen of a Serow from the mainland of Asia. This was in January 1832, and the skin had been transmitted to him by Mr. B. H. Hodgson, British Resident at Katmandoo (or Khatmandu), Nepal. Hodgson's detailed description of this animal, under the name of *Antelope bubalina*, is found in the Proceedings of the Zoological Society, Part II (1832), pp.



PHOTOGRAFI OF A SEROW (*PHILOMIS* SP.), MALE, FROM PHONG MAL, NAM.

12-14. He says: "It is seldom found in herds, however small, and the grown males usually live entirely alone, except in the breeding season. Of all the Deers or Antelopes of these hills (viz: in Nepal) it is the most common. It tenants the central region equidistant from the snows on the one hand, and the plains of India on the other." This Antelope has now to be called *Capricornis sumatraensis* sub-sp. *thur* Hodgson (see Pocock, P. Z. S. 1908, p. 176).

The first record of a Serow inhabiting the Malay Peninsula is, as is to be expected, by Theodore Cantor, in his "Catalogue of Mammals inhabiting the Malayan Peninsula and Islands," originally published in the Journal, Asiatic Society of Bengal, Vol. XV (1846), p. 272, and subsequently reprinted in "Miscellaneous Papers relating to Indo-China," ser. 1, Vol. II (1886), p. 57. However, his remarks are disappointingly meagre. He merely says: "It appears to be numerous on the Malayan Peninsula, but exceedingly difficult to obtain, as it frequents the steepest hilly localities, and is very shy and active." This Malay Peninsular Serow which is now well-known, is, if not identical with, so at least closely allied to, the Sumatran form, and two geographical races of it have been described, viz: *Capricornis sumatraensis swetenhami*, Butler and *Capricornis sumatraensis robinsoni*, Pocock. These, together with five other sub-species, are discussed by Pocock, Proc. Zool. Soc., London, 1908, pp. 173-190.

The Raffles Museum possesses two pairs of horns of this animal, one from Tanjong Rambutan, Perak, and the other from Chankat Mandai, Ulu Kinta, both presented by Mr. E. M. Schwabe in 1905, and the sportsman will find in George Maxwell's "In Malay Forests" full directions as how to obtain this elusive "Wild Goat" or at least to get within a mile of it! (see pp. 167-185). Locally it is known as "Kambing gerun," besides as "Kambing utan," the name recorded by Marsden.

Further species of Serow were recorded from other parts of South-Eastern Asia, from Kashmir, the Himalayas, China, Tonkin and Burmah, Father Heude especially distinguishing himself by describing no less than 24 species from China and Tonkin alone which in the eighties and nineties of last century he with the help of numerous other Catholic Missionaries had collected. The specimens were deposited in the Sikawei Museum, Shanghai. Sowerby (P. Z. S. 1917 pp. 7-26) undertook the trouble of working through this vast collection and succeeded in reducing Heude's 24 species and David's one species to the following:

- Capricornis argyrocrottes*, Heude. The Province of Chekiang, S. E. China.
 .. *viduanus*, Heude. The region of N. E. Ssuehuan and S. Shensi, Central China.
 .. *milne-edwardsi*, David. W. Ssuehuan, N. W. Ssuehuan and S. W. Kansu, W. China.
 .. *collasinus*, Heude. Kuang-tung Province, S. China.

Capricornis rocherianus. Heude. Along Bay, Tonkin, S. W. China.

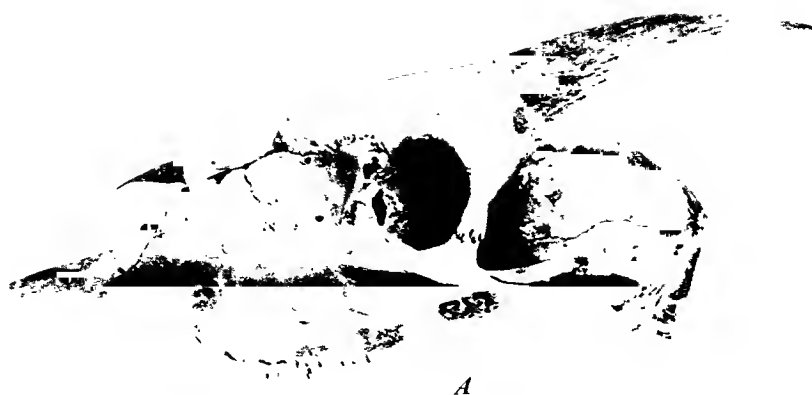
To come now to a description of the Serow from Annam, secured by Messrs. Chochof and Saint-Poulof:

Male: not quite adult, as the condition of the skull shows: coat shaggy: hair coarse: mane well developed. Colour: fore head, from nose to base of horns, rufous: cheeks black: from behind the eyes to base of ears, rusty: back of ears, rusty: inside of ears, white: upper lip, white: under lip, white, enclosing below a median patch of black: beard, white: throat and breast, black: mane long, composed of two sorts of hair: some entirely white, the others, more numerous, white at the base, black distally: belly black, behind with a few grey hair: sides of back with hair white at the base, black distally, producing together a greyish effect: forelegs, black down to the knees, except for a rusty patch at the inside: below knees, rusty, darker in front than behind: hind legs, black down to the hocks, without any grey: below the hocks, rusty brown: tail, black above, white beneath.

Its measurements, taken immediately after death, were: height at the shoulder 821 mm.: total length from between the horns to the tip of the tail 1300 mm.: ears 220 mm.: horns 170 mm.: tail 110 mm.

Pocock, in P. Z. S. 1908, p. 189, gives the measurements of the skulls of four different forms of Serow (*Capricornis sumatraensis*) from Kashmir, Nepal, Chamba (Western Himalayas) and Selangor respectively, and to allow a ready comparison with the skulls of the Serow from Annam and of the above mentioned Serow from Sumatra, presented by Messrs. Jansen and Brooks, I reprint herewith his table, adding the measurements of the two latter Serows. The Sumatran skull, unfortunately, was partly broken, so that two of the measurements could not be taken. It was that of an old male.

The table shows that the Annamite form approaches in its skull measurements nearest the Serow from Chamba, *Capricornis sumatraensis* sub-sp. *rodoni*, Pocock, yet differing from it by being narrower across the promaxillæ, zygomata and the posterior portion of the palate, by its longer, but narrower nasals, and by its greater height at the frontals. The Sumatran skull has in most respects the smallest dimensions, with the exception of the palate which anteriorly is extraordinarily wide. Naturally, a much larger series of skulls would be necessary to arrive at safe conclusions.



SKULL OF A SEROW (*CAPRICORNIS* SP.) FROM PHUONG MAI, ANNAM. $\times \frac{1}{2}$.
A. FROM THE SIDE; B. FROM BELOW; C. FROM ABOVE.

SKULL MEASUREMENTS IN MILLIMETRES.

	Kashmir	Nepal	Chamba	Selangor	Sumatra	Annam
Basal length from occipital suture to distal end of premaxillae	245	241	223	240	?	220
Width across zygomata	130	128	127	117	112	114
.. .. maxillae	98	98	98	102	85	94
.. .. between orbits	93	87	78	81	75	75
Median length of frontal	112	105	112	118	101	113
Median length of nasal	94	93	73	103	78	83
Width across nasals	50	47	41	48	44	31
Width across premaxillae (maximum)	53	51	50	54	42	42
Width across premaxillae (distal end)	32	31	26	27	25	23
Height from alveolus of molar 2 to summit of frontals	104	94	98	114	97	105
Height from alveolus of premolar 3 to summit of nasals	94	84	90	103	90	92
Length of cheek-teeth	90	87	93	92	81	95
Length and width of last molar	20: 13	20: 16	20: 12	21: 13	18: 12	20: 12
Median length of palate to distal end of premaxillae	162	167	148	161	?	148
Width of palate between last molars	60	52	57	50	52	49
Width of palate between first premolars	41	38	38	38	42	37

Going by external characters and using the key given by Pocock (P. Z. S. 1908, p. 190) for identifying his seven geographical races of *C. sumatraensis*, we find, however, that the Serow from Annam differs markedly from the subspecies *rodoni*, the latter having "breast and underside white, and sharply defined from the dark colour of the rest of the body," and that it comes nearest to the sub-species *janrachi*, from Darjiling, though differing from it by its forehead being rufous, instead of coal black, by its coat being shaggy, instead of 'short at all seasons,' and other characters.

Neither does Sowerby's revision of Heude's 24 species (see P. Z. S. 1917, pp. 7-26) lead to a satisfactory conclusion as to the specific position of our Serow. According to locality it ought to be *Capricornis rocherianus* Heude, from Along Bay, Tonkin, but this latter species is distinguished by its creamy-white stockings. Mr. Kloss who has been working up the Mammals of Siam, tells me that he has from there Serow skins with brown legs which he considers to come under *milne-edwardsi* or *trifluns*. So it is very possible that the Serow from Annam may belong to one of these two species. But more material and much more study will be required before this question can be settled satisfactorily.

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Some Singapore Boletinae.

BY

N. PATOUILLARD AND C. F. BAKER.

On August 21st, 1917, during a period of frequent showers, an hour's work in a narrow strip on the east side of the Gardens' Jungle in the Singapore Botanical Gardens produced specimens of sixteen species, representing four generic groups, of the Boletinae. It would not have been possible to duplicate this remarkable showing on any subsequent day of the year. Evidently there had been optimum conditions for Boleti just previous to August 21st.

Diagnoses of all these species were prepared from the living plants, measurements taken from many specimens, and vertical section outlines made, after which the material was rapidly and carefully dried. The species fall into four generic groups, provided *Boletopsis* be considered of generic value. The genus *Phylloporus* of Quelet, with spores formed by anastomosing lamellae, is well represented by *Phylloporus maluccensis* (No. 5004). *Strobilomyces* finds a characteristic representative in *S. porphyrius* (No. 5002). The genus (or subgenus) *Boletopsis* is represented by three very distinct species, *B. icterinus*, *B. singaporensis*, and *B. corrugatus*.

Among the sixteen species there are represented three distinct types of spores: 1st, the usual type for *Boletus*, including those of most of the species; 2nd, a banded type, the spores bearing narrow longitudinal bands in relief, as in *Boletopsis singaporensis* and *Strobilomyces porphyrius*; 3rd, a reticulate type, the spores being strongly reticulate-alveolate, a remarkable feature found also in *Tuber*, but quite unique in *Boletus*. This type is represented by one species, *Boletus retisporus*.

All of these species have been compared, with great care, with species which have been recorded from the Far East by Berkeley, Petch, and others, and especially with those described by Masee from the collections of Ridley. With the full descriptions taken from living specimens, it has been found impossible to crowd any of these species into the congeries of forms under previously recorded names. Indeed, it would be only the purest guess-work, with any comparisons of existing herbarium material. It must be understood that most of the conspicuous characters of the living plants are evanescent and that but the remotest conception of the living plant can be had from a dried specimens unaccompanied by detailed data taken from the living plant. Colored drawings alone will not suffice, since many clearly diagnostic characters cannot be

shown in such drawings. Even the simple process of drying, which was uniform for all the species, brought out various striking differences. For instance in *Boletus spiniter* and *Boletus americanus*, as well as in most of the other species, the flesh is very firm and holds its form well while drying, whereas in *Boletus retispinus* and *Strobilomates porphyreus*, the flesh softens very rapidly, collapse taking place before drying is accomplished. On the other hand, one species, *Boletus tristis*, dried out very readily and rapidly without the aid of heat, just as it lay, on an open table.

The characterisations of all the species under consideration are presented herewith in synoptical form, using, for separation, where possible, the most readily recognizable characters, so that other students may easily follow up the work and make more extensive comparisons of living material and of material from other parts of the Peninsula.

Section I. Young plants with a distinct veil, and a persistent or evanescent, fibrous or gelatinous, annulus; springing from white mycelium (*Boletopsis*).

- A. Veil gelatinous; pileus pale brown, radially irregularly shallowly corrugate, and centrally short tomentose, the outer half viscid; hymenium pale yellow; stipe brownish, paler above, short shaggy and covered with gelatinous droplets; flesh cream colored, with a reddish tint near upper surface of pileus; pileus 4—4.5 cm. in diameter; stipe 6—12 mm. × 6 cm.; spores elliptical, very pale, nearly white, 12—15 microm.; tomentum of pileus forming an erect pile, 100—300 microm. in height; plant occurring in large tufts (No. 5003).

***Boletopsis corrugatus*, sp. nov.**

- AA. Veil fibrous.

- B. Veil thick, arachnoid, bright yellow; annulus appressed and adherent, ragged scaly; pileus and stipe sulphur yellow, mealy, opaque; hymenium pale leather colored; stipe becoming minutely brownish scaly; flesh of pileus white, of stipe yellow; pores shallow, minute, subterete, septa thick and dark lined; hymenial surface narrowly and slightly sinuate where it joins stipe; pileus 2.5—3 cm. in diameter; stipe 3—5 mm. × 4—5.5 cm.; spores elliptical, smooth, pale in color, 8—11 × 4—5 microm.; hyphal threads of the veil with brown granulations (No. 4991).

***Boletopsis icterinus*, sp. nov.**

- BB. Veil thin, membranous, viscid, at first white, finally leaving a completely separated and ragged and evanescent annulus; pileus smooth, shining, slightly viscid, and light bay in color; hymenium sordid yellow, stipe shining light bay, pale above; flesh of pileus faintly yellowish, of stipe white changing; pores large, deep very irregular, with

some secondary septa: septa thin and unlined: hymenial surface narrowly but very deeply sinuate next stipe, the stipe free to the pileus: pileus 4.5 cm. in diameter: stipe 6—12 mm. \times 14 cm.: spores brown, ovoid, with narrow longitudinal raised bands, 13—15 \times 8—10 microm. (No. 4992).

Boletopsis singaporensis, sp. nov.

Section II. Without distinguishable veil or annulus even in young plants: springing from either white or yellow mycelium (*Boletus*, *Phylloporus*, *Strobilomyces*).

A. Pores large, very irregular and largely compound, with thin septa and with short secondary septa subdividing the larger pores into two or three.

B. Hymenial surface decurrent on to stipe: plants solitary, from bright yellow mycelium: pileus leather colored, minutely roughened, opaque: hymenium sordid yellowish: stipe pale below, thickly streaked with reddish brown above: flesh of pileus and stipe cream colored, not changing: pileus 4.5—6 cm. in diameter: stipe slender 4—8 mm. \times 3.5—5.5 cm.: spores elliptical, smooth, very pale, 6—8 \times 4—4.5 microm. (No. 4993).

Boletus aureo-mycetinus, sp. nov.

BB. Hymenial surface deeply and rather broadly sinuate next stipe: plant in groups of 2 to 4 or more, from a white mycelium: pileus rich velvety bay: hymenium grey: stipe pale brownish nearly smooth: flesh of pileus and stipe white, not changing: pileus 7—10 cm. in diameter, stipe greatly inflated, 2.5—4.5 cm. \times 8—10.5 cm.: spores ovoid, smooth, nearly white, 6 \times 5 microm.: cystidia numerous, very prominent, rigid and reddish, 60 \times 10 microm., thus resembling the cystidia of *Hymenochaete*. (No. 4994).

Boletus spinifer, sp. nov.

AA. Pores large, to medium, or small, more regular, largely simple.

B. Flesh not changing to blue on bruising: pileus smooth or nearly so.

C. Plant springing from white mycelium.

D. Pileus some shade of brown or sooty brown: stipe white to brownish or drab.

E. Pileus minutely mealy or velvety, dry, opaque, never smooth and shining.

F. Pileus sooty-mealy, or velvety, quite blackened with this over theumber ground color.

G. Flesh white, not changing.

- II. Pileus umber to chocolate brown, more or less sooty mealy centrally; hymenium cream colored, often with a slight yellowish tint, its surface next stipe very slightly sinuate or nearly adnate; stipe umber brown, white at top and bottom; pileus 2.5—3.5 cm. in diameter, stipe 5—8 mm. \times 4.5—5.5 cm.; spores fusiform, light brown, 12—14 \times 4 microm. (No. 4995).

***Boletus tristis*, sp. nov.**

- III. Pileus deep sooty-velvety throughout; hymenium pale yellow, its surface next stipe distinctly but narrowly sinuate; stipe reddish brown, base white; pileus 5.5 cm. in diameter; stipe 9—10 mm. \times 7 cm.; pores very small and nearly terete; spores elliptic-cuneiform, yellowish brown, 12 \times 6 microm. (No. 5005).

***Boletus phaeocephalus*, sp. nov.**

- GG. Flesh cream colored to brownish, blackening on exposure; pileus sooty and sooty-mealy; hymenium pale bay; stipe sooty; pileus 4.75 cm. in diameter; stipe 7—10 \times 6 cm.; spores fusiform, pale, 10—12 \times 3—4 microm.; cystidea abundant, pale, 30 \times 12 microm. (No. 4996).

***Boletus nigricans*, sp. nov.**

- FF. Pileus not sooty-mealy, or sooty-velvety, color paler; flesh white, not changing.

- G. Stipe finely or coarsely scrobiculate, at least in part.

- H. Stipe finely scrobiculate above; surface of pileus usually minutely reticulate-ly broken; pileus dark umber-brown; hymenium pale

umber, its surface nearly adnate to stipe; stipe white below to pale umber above; pileus 6—8 cm. in diameter; stipe 7—12 mm. \times 7—10 cm. spores elliptical, pale brown, $12 \times 3-4$ microm. (No. 4997).

Boletus umbrinellus, sp. nov.

- III. Stipe deeply, irregularly, very coarsely, sulcate-scribulate throughout. more finely above; surface of pileus not broken, pale yellowish brown, darker centrally; hymenium pale drab; stipe cream colored; pileus 4 cm. in diameter; stipe 10—12 mm. \times 5 cm.; spores fusoid, pale, 12×6 microm. (No. 5004).

Phylloporus malaccensis, sp. nov.

- GG. Stipe not scribulate: surface of pileus velvety and unbroken.
H. Stipe smooth; pileus leather colored, smooth, opaque; hymenium very pale drab; stipe leather colored, smooth, paler above; pileus 3.5—6.5 cm. diameter; stipe 5—10 mm. \times 4.5—6.5 cm.; spores elliptical, $7-9 \times 4$ microm., very pale (No. 4998).

Boletus veluticeps, sp. nov.

- HH. Stipe finely, openly, transverse scaly throughout, finer at top and bottom; pileus drab throughout, stipe blue-grey; hymenium yellowish brown, its surface next stipe very narrowly sinuate; flesh pale drab throughout, slightly darkening on exposure; pileus 4 cm. in diameter; stipe 7—8 mm. \times 6.5 cm.; spores elliptical, pale, $12-15 \times 4$ microm. (No. 5006).

Boletus cyanopus, sp. nov.

EE. Pileus perfectly smooth, shining, slightly viscid, pale leather colored; hymenium sordid yellow; stipe pale sordid leather colored, darker and shallowly somewhat reticulate-fibrillose above; flesh cream colored, not changing; pileus 3.5—4.5 cm. in diameter; stipe 5—10 mm. \times 4—5 cm.; spores elliptical, very pale, 8—10 \times 4—5 microm. (No. 4999).

Boletus viscidulus, sp. nov.

DD. Pileus and stipe brick red, quite smooth, and opaque; hymenium yellow, surface next stipe rather deeply sinuate; stipe shallowly reticulate-fibrillose above; flesh of pileus pale yellow, of stipe bright yellow becoming reddish on exposure; pileus 4—9 cm. in diameter; stipe 8—17 mm. \times 7—10 cm.; spores brown, elliptical, 12 \times 9 microm. reticulate-alveolate, the alveolae profound and 4, 5, or 6 sided (No. 5000).

Boletus retisporus, sp. nov.

CC. Plant springing from bright yellow mycelium; flesh of stipe and pileus yellow, not changing; pileus yellowish brown, opaque, nearly smooth; hymenium pale leather colored, slightly sinuate; stipe with reddish brown and yellowish shades; pileus 12—14 mm. in diameter; stipe 1.5—2 mm. \times 2.5 cm.; spores elliptical, hyaline, 9—12 \times 4—5 microm. (No. 5001).

Boletus pernanus, sp. nov.

BB. Flesh changing to blue on bruising; pileus deeply squarrose, purple scalp, exposing lines of yellow tissue beneath; hymenium sordid yellowish; stipe umber brown, smooth; flesh of pileus above yellow, below and of stipe, cream colored, darkening on exposure; pileus 3.5—4.5 cm. in diameter; stipe 6—8 mm. \times 6—9 cm.; spores ochre-colored, elongate elliptical, longitudinally striate, 15—20 \times 6—8 microm. (No. 5002).

Strobilomyces porphyrius, sp. nov.

The Position of Gunong Say.

BY H. B. MARSHALL.

Gunong Say, mentioned in this Journal, 1917, p. 265, as one of the localities where James Motley collected, is situated on the right bank of the river Brunei approximately $2\frac{1}{4}$ miles S. by W. of the town itself which is built on the water in a bend of the river. The hill is directly facing the residency which is on the opposite side of the river and bears nearly due N. E. and $2\frac{1}{4}$ miles from Gunong Say, so that it is about equidistant from the town and residency. A neighbouring hill is Gunong Sumur, a mile to the S. E. from Gunong Say. It is named on the Admiralty Charts "Hamilton Hill," possibly after some naval man who had been surveying in Brunei. The height of Gunong Say is 760 feet.

They are both conspicuous landmarks and can be seen by steamers plying between Singapore and Labuan.

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Malayan Membracidae.

W. D. FUNKHOUSER.

(Contribution from the Entomological Laboratory of
Cornell University.)

Through the courtesy of Professor C. F. Baker, Dean of the College of Agriculture at Los Banos, Philippine Islands, I have been permitted to study a very interesting series of insects of the family Membracidae collected during the Summer of 1917 at Singapore and the Island of Penang.

The collection contains twelve new species and records of a number of species of Walker, Distant, Melichar and Bierman which form a valuable addition to our knowledge of the distribution of the Indian homopterous fauna.

All of the species listed were collected by Professor Baker.

1. *Xiphistes orientalis*, sp. nov.

Uniform reddish-brown; thick bodied; horns heavy and blunt; tegmina opaque; scutellum largely exposed.

Head dark brown with faint median ferruginous line, rugous, closely and finely punctate, sparingly pubescent with brownish hairs; eyes large, prominent, grayish-white; ocelli prominent, pearly, about equidistant from each other and from the eyes and situated on a line drawn through centers of eyes; clypeus much longer than wide, extending for more than half its length below inferior margin of face, pubescent, tip rounded.

Prothorax black-brown, rough, very pubescent with short, reddish-brown hairs which almost entirely conceal the weak punctation; humeral angles very large, heavy, triangular and blunt, projecting directly laterad, suprahumeral horns short, very stout, about as long as their width at base and about as far apart at their bases as the basal width of one horn, projecting upward, outward and slightly forward, upper surfaces very rough and nodulose with irregular carinae, tips blunt, rounded and somewhat deflexed; median carina strongly percurrent; posterior process long, almost straight, slightly deflexed at tip, strongly centrally carinate, base laterally carinate on each side, tip gradually acute and extending about half way between internal angles and tips of tegmina, base only lightly touching scutellum; scutellum plainly visible on each side.

Sides of thorax thickly pubescent with reddish hairs. Tooth of prothorax very prominent; that of mesothorax very weak.

Tegmina opaque, reddish-brown, slightly pubescent and punctate at base, veins prominent, tip acute, marginal border very narrow or lacking. Hind wings with four apical areas.

Undersurface of body very dark brown, almost black. Ovipositor black. Ventral surface of abdomen somewhat pubescent with whitish tomentose patches at base.

Legs dark brown; femora swollen and smooth; tibiae triangular and finely spined; tarsi ferruginous.

Length 8 mm.; width between extremities of suprahumeral horns 4 mm.

Type: female (Baker's duplicate No. 9084).

Locality: Singapore.

2. *Centrochares horrificus*, Westwood.

- | | | |
|-------|--------------------------------|---|
| 1837. | <i>Centrotus horrificus</i> | Westw. Proc. Zool. Soc. 130. |
| 1841. | | Guer. Mag. Zool. Ser. 2, III, Ins. Pl. 82. |
| 1842. | | Lefebvre Ann. Soc. Fr. Bull. 1842, p. xxi. |
| 1851. | <i>Pterygia horrificus</i> | Walker List Hom. Brit. Mus. 500, 9. |
| 1852. | | Walker List Hom. IV, Tab. 4, figs. 4 and 5. |
| 1866. | <i>Centrochares horrificus</i> | Stal Analect. Hem. 386. |
| 1870. | | Stal Hem. Phil. 734, 1. |
| 1903. | <i>Pterygia horrifica</i> | Buckt. Mon. Memb. 73, Pl. 12, fig. 5. |
| 1903. | <i>Pterygia spinula</i> | Buckt. Mon. Memb. 73, Pl. 12, fig. 4. |
| 1903. | <i>Centrochares horrificus</i> | Buckt. Mon. Memb. 266. |
| 1914. | | Funkh. Journ. Ent. & Zool. VI: 2, p. 69, 6. |
| 1915. | | Dist. Ann. Mag. Nat. Hist. 16: 91, p. 327. |
| 1915. | | Funkh. Rev. Phil. Memb. 370. |
| 1918. | | Funkh. Notes Phil. Memb. 23. |

One specimen taken at Singapore and bearing Baker's duplicate No. 8779. Apparently this species has a wide distribution throughout eastern Asia and the East Indies. The variation shown in examples studied does not warrant the splitting up of the species.

3. **Leptocentrus leucaspis**, Walker.

1858. *Centrotus leucaspis* Walk. List. Hom. B. M. Suppl. 158.
 1903. *Leptocentrus leucaspis* Buckt. Mon. Memb. 235. Pl. 53. figs. 3a. b.
 1907. Dist. Fauna Brit. Ind. 30. 2139.
 1915. Funkh. Rev. Phil. Memb. 379.
 1918. Funkh. Notes Phil. Memb. 37.

One specimen bearing Baker's duplicate No. 8771 taken at Singapore.

4. **Leptocentrus obortus**, Distant.

1916. *Leptocentrus obortus* Dist. Fauna Brit. Ind. App. 154. 3347.

Two specimens (Baker's duplicate numbers 8772 and 8976) collected at Singapore.

5. **Leptocentrus longispinus**, Distant.

1907. *Leptocentrus longispinus* Dist. Fauna Brit. Ind. 31. 2141.

One male and three females all collected at Singapore.

6. **Centrotypus asmodeus**, Distant.

1907. *Centrotypus asmodeus* Dist. Fauna Brit. Ind. 36. 2150.
 One female (Baker's duplicate No. 8978) taken at Singapore.

7. **Nilautama minutispina**, sp. nov.

Black, punctate, pubescent; posterior process very short and slender; tegmina smoky-hyaline, wrinkled; eyes red; scutellum white tomentose.

Head twice as broad as long, black, finely punctate, densely pubescent with short golden hairs; base sinuate; eyes red; ocelli not prominent, gray, equidistant from each other and from the eyes and situated on a line above centers of eyes; clypeus twice as long as wide, extending for two-thirds its length below the inferior margin of the face, tip pubescent and rounded.

Prothorax narrow, black, finely punctate, sparingly pubescent with golden hairs; metopidium narrow, much sunken below supra-humeral horns; humeral angles short, blunt, not prominent; supra-humeral horns strong, very wide as seen from above, extending almost directly outward, somewhat upward and slightly backward, triquerate, tips blunt and recurved; posterior process very slender and short, extending not farther than tip of scutellum, arising well above base of pronotum, tricarinate, acute, nearly straight, tip

very slightly upraised. Scutellum entirely exposed, triangular, as long as its width at base; base thickly covered with white tomentose pubescence; tip rounded in general outline, notched with the point on each side of notch extended into a fine tooth.

Tegmina long, narrow, smoky-hyaline, much wrinkled; base white and punctate; costal margins ferruginous; veins prominent, somewhat hairy; tips rounded, extending well beyond extremity of abdomen.

Sides and undersurface of the thorax white tomentose; undersurface of abdomen brown.

Legs reddish-brown, slender, hairy; tarsi flavous.

Length 7 mm.; width between tips of suprahumeral 4 mm.

Type: female (Baker's duplicate No. 9086).

Locality: Island of Penang.

8. **Anchonoides variegatus**, sp. nov.

Golden brown with white tomentose stripes; tegmina smoky-hyaline with broad, clear band across centers and with bases brown; posterior process strongly sinuate with two elevations behind suprahumeral horns.

Head wider than long, rugose, brown with white tomentose patches, finely and closely punctate, densely pubescent; base sinuate; eyes brown, reflexed; ocelli prominent, brown, farther from each other than from the eyes and situated above a line passing through centers of eyes; clypeus much longer than wide, sublobate, extending for more than two-thirds its length below the interior margin of the face, densely white pubescent, tip rounded; interior margins of genae produced in blunt angles; antennae prominent.

Prothorax brown, finely punctate, sparingly pubescent; metopidium somewhat nodulate; four white tomentose lines on cephalic prothorax, one arising above each eye, extending dorsomedad to meet the line from the other side at the median carina at a point about even with the bases of the suprahumeral horns; another originating beneath each humeral angle and extending upward between the suprahumeral horns and backward to base of posterior process; a narrower line extending along lateral margin of pronotum from beneath the suprahumeral horn to base of posterior process. Humeral angles prominent, blunt, triangular, extending outward about half as far as the suprahumeral horns. Suprahumeral horns heavy, sinuate, extending outward and a little upward, upper middle portion much elevated and nodulate, tips obliquely truncate with posterior angle produced. Median carina strongly percurrent. Posterior process heavy, nodulate, thrown upward in two strong loops, one above the scutellum and one above the internal angles of the tegmina, the anterior elevation about twice as high as the

posterior: tip extending almost as far as the end of the abdomen but not reaching the extremities of the tegmina. The entire dorsal outline as seen from the side showing three elevations, one between the suprahumeral horns, one above the scutellum and one above the internal angles of the tegmina. Scutellum entirely exposed, sinuate, white tomentose, tip truncate.

Tegmina divided into four color areas, the transverse bands being about equal in length. The base is brown, entirely opaque, punctate and slightly pubescent; the second band is smoky-hyaline; the third band entirely clear; the remainder of the tegmen amber-hyaline. The veins are prominent, those in the apical area somewhat nodulate.

Sides and undersurface of thorax uniform dark brown with white tomentose patches; tibiae ferruginous shading to flavous at distal extremities; tarsi flavous.

Length 5 mm.; width between tips of suprahumeral 4 mm.

Type: female (Unique type in Professor Baker's collection).

Locality: Singapore.

This species shows a much higher posterior elevation on the posterior process and much shorter and less elevated suprahumeral horns than *A. typicus* Distant, the type of the genus.

9. **Ebhul varius**, Walker.

1858.	<i>Centrotus varius</i>	Walk. List Hom. Brit. Mus. Suppl. 162.
1869.	<i>Leptobelus varius</i>	Stal Bid. Memb. Kan. 285. 6.
1885.		Atkins J. A. S. B. 54. p. 82.
1907.	<i>Ebhul varius</i>	Dist. Fauna Brit. Ind. 59. 2489.
1914.		Limb. Trans. Ent. Soc. Lond. 1913. p. 470.
1915.		Funkh. Rev. Phil. Memb. 393.
1916.		Dist. Fauna Brit. Ind. App. p. 169.

Five specimens, all females. Two taken at Singapore and three collected from the Island of Penang.

10. **Sipylus dilatatus**, Walker.

1851.	<i>Centrotus dilatatus</i>	Walk. List Hom. B. M. 630. 74.
1914.	<i>Sipylus nodipennis</i>	Funkh. Journ. Ent. & Zoo. VI: 72. 15. fig. 5.
1915.		Funkh. Rev. Phil. Memb. 392. Pl. 2. fig. 15.

1916. *Sipylus dilatatus* Dist. Rhynchotal Notes, 330.
 1918. Funkh. Notes Phil. Memb. 29.

Two females and one male, all from Singapore.

11. ***Tricentrus assamensis***, Distant.

1907. *Tricentrus assamensis* Dist. Fauna Brit. Ind. 57, 2186.

Three specimens, all females. Two from the Island of Penang and one from Singapore.

12. ***Tricentrus albomaculatus***, Distant.

1907. *Tricentrus albomaculatus* Dist. Fauna Brit. Ind. 56, 2183.
 1914. Kershaw Ann. Soc. Belg. 37, 191-201 pp. figs. 1-13.
 1916. Dist. Fauna Brit. Ind. App. 166.

Four specimens. One female from the Island of Penang; one female and two males from Singapore.

13. ***Tricentrus resectus***, Distant.

1916. *Tricentrus resectus* Dist. Fauna Brit. Ind. App. 167, 3370.

Three specimens. One male and one female from Singapore; one female from the Island of Penang.

14. ***Tricentrus gibbosulus***, Walker.

1858. *Centrotus gibbosulus* Walker Ins. Saund. 80.
 1886. Atkins J. A. S. B. 55, p. 198.
 1906. Oshan. Pal. Hem. 43, 159.
 1907. *Tricentrus gibbosulus* Dist. Fauna Brit. Ind. 53, 2178.
 1914. Funkh. Journ. N. Y. Ent. Soc. XXII: 3, 238.
 1916. Dist. Fauna Brit. Ind. App. 167.

Six specimens. Three males from Singapore; two males and one female from the Island of Penang.

Walker described a second *Centrotus gibbosulus* in 1868 (Journ. Linn. Soc. Zool. X: 187) which Distant has made the type of his new genus *Maurva* (Ann. and Mag. Nat. Hist. Ser. 8, Vol. 17, p. 326, April, 1916).

15. ***Tricentrus spinicornis***, sp. nov.

Black, punctate, pubescent; suprahumeral horn thin, sharp and spinelike; posterior process extending beyond tip of abdomen; tegmina fuscous-hyaline, base black; legs brown.

Head broader than long, black, densely pubescent with silvery hairs which conceal the fine punctuation: base sinuate, much higher in middle: eyes prominent, black-brown; ocelli prominent, amber-colored, shining, glassy, somewhat farther from each other than from the eyes and situated slightly above a line drawn through centers of eyes: clypeus about as broad as long, projecting for about half its length below inferior margin of face, tip rounded and very hairy.

Prothorax uniform black, finely punctured, thickly pubescent with silvery hairs: humeral angles weak, triangular, blunt: suprahumeral horns long, slender, sharp, ridged, extending about equally upward and outward and slightly turned backward at tips, distance between bases 1.7 mm., upper surface of horn centrally longitudinally carinate: median carina percurrent: posterior process long, gradually acuminate, tricarinate, extending slightly beyond tip of abdomen and well beyond internal angles of tegmina.

Tegmina fuscous-hyaline, base black and punctate, costal margin somewhat pubescent, veins prominent.

Undersurface of body very dark brown, almost black. Legs light brown: tibiae finely spined; hind trochanters armed with strong teeth.

Length 6 mm.: width between tips of suprahumeral horns 5 mm.

Type: female (Baker's duplicate No. 8775). Type in author's collection; two paratypes in Professor Baker's collection.

Locality: Singapore.

Three specimens were examined, all females. Two were from Singapore and one from the Island of Penang.

16. **Tricentrus brunneus**, sp. nov.

Near the preceding but smaller and differing particularly in the size and shape of the suprahumeral horns.

Uniform golden brown, finely punctate and pubescent with silvery hairs: suprahumeral horns short, blunt, tricarinate: posterior process reaching tip of abdomen: tegmina smoky-hyaline with base black.

Head wider than long, brown, completely covered with fine white pubescence: base rounded: eyes very large, prominent, brown: ocelli protruded, pearly, about equidistant from each other and from the eyes and situated slightly above an imaginary line drawn through centers of eyes: clypeus very long, projecting for almost its entire length below inferior margin of face, tip covered with long, straight, white hairs: inferior margin of face only slightly sinuate, almost truncate: antennae very slender.

Prothorax uniform brown, finely punctate, closely pubescent with short silvery hairs; humeral angles prominent, triangular, extending outward almost half as far as the suprahumeral horns; suprahumeral horns short, slender, tips blunt, anterior, dorsal and posterior surfaces carinate, extending outward and upward, about as far apart at bases as the length of one horn; posterior process long, slender, straight, extending almost to tip of abdomen, closely impinging on scutellum, tip darker.

Tegmina smoky-hyaline, wrinkled, base black-brown and punctate, veins prominent, slight dark brown marking at apicalcostal margin.

Undersurface of body very dark brown, almost black. Hind trochanters armed with strong teeth. Legs uniform light brown; femora smooth; tibiae triquerate and bearing at edges fine spines.

Length 5.5 mm.; width between extremities of suprahumeral horns 3.5 mm.

Type: female (Baker's duplicate No. 8774).

Locality: Singapore.

17. *Tricentrus truncaticornis*, sp. nov.

Short, heavy-bodied, black; pronotum as seen from above about as broad as long; suprahumeral horns very long, equal in width throughout length, tips squarely truncate; tegmina ferruginous-hyaline, bases black, veins slightly nodulate.

Head much wider than long, black, thickly punctate, closely pubescent; base strongly sinuate; eyes white tinged with reddish which makes them very prominent as compared with the black head and body; ocelli pearly, about equidistant from each other and from the eyes and situated slightly above a line passing through centers of eyes; clypeus as wide as long, tip rounded and practically containing the sinuate anterior marginal outline of the face.

Thorax black; punctate, sparingly pubescent; metopidium wider than high; humeral angles very inconspicuous, almost hidden under the large suprahumeral horns; suprahumeral horns long, broad, flattened, as far apart at their bases as the width of the head, longitudinally striate above, tips squarely cut off at right angles leaving a truncate end as wide as the base; posterior process short, barely reaching internal angles of tegmina, base wide, extremity suddenly narrowed to form an acute tip.

Tegmina ferruginous-hyaline, so wrinkled between veins as to be almost opaque; base black and punctate; veins prominent and bearing scattered nodules.

Legs and undersurface of body uniform black with scattered pubescence. Hind trochanters armed with strong, prominent teeth.

Length 6 mm.; width between extremities of suprahumeral horns 6 mm.

Type: female (Baker's duplicate No. 8773).

Locality: Singapore.

The foregoing species is close to *T. auritus* which Buckton described as *Otaris auritus* from Sumatra (Buckton, Monograph of the Membracidae, p. 429, Pl. 59, figs. 1, 1a, 1903), but differs decidedly in size and in the comparative proportions of the suprahumeral horns and the posterior process.

18. **Centruchus laticornis**, sp. nov.

Resembling the preceding species in general appearance but differing in having unarmed hind trochanters which I believe is a sufficient generic character to distinguish the genera *Tricentrus* and *Centruchus* which are in other respects very similar.

Body subtriangular; suprahumeral horns broad and flat with truncate tips; posterior process short and narrow; tegmina ferruginous with faint median white band; entire body largely marked with white tomentose patches.

Head wider than long, black, rugose, finely punctate, sparingly pubescent; base regularly and evenly rounded; eyes prominent, brown; ocelli conspicuous, pearly, a little farther from each other than from the eyes and situated well above a line passing through centers of eyes; clypeus longer than wide, trilobed at apex, extending well below the inferior margin of the face, tip rounded and bearing long, stiff, white hairs.

Prothorax black, finely punctate, sparingly pubescent, decorated with irregular white tomentose patches; metopidium much broader than high; humeral angles weak, triangular, inconspicuous; suprahumeral horns long, broad, flattened dorsoventrally, tips squarely truncate, dorsal surface with longitudinal carina slightly behind middle, horns about as far apart at bases as the width of the head; median carina percurrent; posterior process short, uniformly narrow, tricarinate, largely tomentose, tip acute, extending just to the internal angles of the tegmina; scutellum broad, notched, tomentose.

Tegmina ferruginous, wrinkled, subopaque; base brown and punctate; a faint whitish band extending across the central part of tegmina just below the tip of the posterior process; veins prominent and slightly nodulose in apical region.

Undersurface of body black with white tomentose patches. Legs uniformly light ferruginous brown.

Length 6 mm.; width between extremities of suprahumeral horns 6 mm.

Type: female (Unique type in Professor Baker's collection).

Locality: Singapore.

19. **Gargara piceola**, Melichar.

1903. *Gargara piceola* Melich. *Hom. Ceylon* 122. 1.

1907. Dist. Fauna Brit. Ind. 60. 2190.
One female from Singapore.

20. **Gargara rubrogranulata**, Bierman.

1910. *Gargara rubrogranulata* Bier. *Notes Mus. Leiden* 33. 45.
One female from Singapore.

21. **Gargara nitidipennis**, Funkhouser.

1914. *Gargara nitidipennis* Funkh. *Jour. Ent. & Zoo.* VI: 71.
14.

1915. Funkh. *Rev. Phil. Memb.* 399.

1918. Funkh. *Notes Phil. Memb.* 32.

Three males and one female from Singapore; one male from the Island of Penang.

The species shows considerable minor variations but I can find no specific characters to separate the Malay material from the type specimens from the Philippine Islands.

22. **Gargara projecta**, sp. nov.

Distinguished by the position of the head which is not deflexed or vertical as in most Membracidae but is projected well forward at the inferior margin.

Uniform brown, punctate, pubescent; head extending more or less forward, not deflexed; tegmina smoky-buff, very slightly brown and punctate at base.

Head projected, clypeus farther cephalad than base as seen from a side view, entire frontal outline of head continuing slope of metopidium; brown, smooth, thickly pubescent with fine, short, yellowish hairs; base weakly sinuate; eyes prominent and brown, their inferior margins continuing the almost straight line formed by the inferior margins of face and clypeus; ocelli not prominent, pearly, farther from each other than from the eyes and situated very slightly above an imaginary line passing through centers of eyes; clypeus swollen, convex in front, about as wide as long, tip rounded, somewhat hairy and continuing the general outline of the inferior margin of the face; antennae very thin and inconspicuous.

Prothorax uniform brown, punctate, pubescent; metopidium sloping, somewhat flattened, slightly rugose, broader than high as

seen from the front; humeral angles not prominent, smooth, blunt at tips; posterior process long, slender, gradually acuminate, carinate above with median ridge which does not extend over the metopidium, tip extending well beyond the internal angles of the tegmina, darker in color than the rest of process, slightly depressed; scutellum distinct on either side of posterior process but closely impinging upon it.

Tegmina uniform smoky-hyaline, wrinkled, base narrowly brown and punctate, veins prominent, tips rounded and extending just beyond the extremity of the abdomen.

Undersurface of body darker brown, pubescent. Legs the same color as the pronotum; hind trochanters unarmed; tibiae finely spined; tarsi shading to flavous; claws brown.

Length 5 mm.; width between extremities of humeral angles 2.3 mm.

Type: female.

Type locality: Singapore.

Described from six specimens: two females and two males from Singapore and one female and one male from the Island of Penang.

Type (Baker's duplicate No. 8981) and one paratype (No. 8979) in author's collection; allotype and three paratypes in Professor Baker's collection.

23. *Gargara penangi*, sp. nov.

Uniform brown; tegmina slightly mottled; posterior process narrow at base, swollen in middle and acute at apex; sides of thorax white tomentose.

Head much deflexed, as wide as long, brown, thickly covered with yellowish pubescence which almost entirely conceals the faint punctuation; base broadly sinuate; eyes large, prominent, mottled brown, extending almost as far lateral as humeral angles; ocelli prominent, shining, pearly, almost twice as far from each other as from the eyes and situated well above a line drawn through centers of eyes; inferior margin of face sinuate and projected; clypeus longer than wide, extending for half its length below inferior margin of face, tip broadened, rounded, very hairy; antennae very long and very slender.

Prothorax uniform brown, finely punctate, thickly pubescent with yellowish hairs; metopidium convex, slightly depressed above base of head; humeral angles prominent, sub-conical, blunt; highest part of pronotum above humeral angles almost flat; median carina not visible over front of pronotum; posterior process short, not reaching internal angles of tegmina, narrow and constricted at base, swollen and strongly carinate above in middle, suddenly narrowed to acute apex; scutellum well exposed, tomentose at base.

Tegmina amber-hyaline; base brown, punctate and pubescent; irregular brown fascia just behind internal angles.

Sides of head and thorax white tomentose; undersurface of thorax and abdomen brown; tip of ovipositor slightly ferruginous.

Legs brown, femora darker than tibiae which shade into flavous at distal ends; tarsi luteous; claws brown.

Length 4.5 mm.; width between tips of humeral angles 2.1 mm.

Type: female. Male somewhat smaller and darker.

Locality: Island of Penang.

Described from a pair from Penang. Type in Professor Baker's collection; allotype in author's collection.

24. *Gargara triangulata*, sp. nov.

Short, thick, heavy-bodied species; brown with white pubescence; pronotum almost triangular as seen from above; tegmina ferruginous, semi-opaque.

Head wider than long, brown, covered with dense white pubescence; base weakly sinuate; eyes large, prominent, brown; ocelli small, white, shining, glassy, farther from each other than from the eyes and situated well above a line passing through centers of eyes; inferior margin of genae sinuate; clypeus almost as broad as long, extending for half its length below inferior margin of face, tip broadly rounded and only slightly pubescent.

Prothorax uniform brown but so irregularly covered with long white pubescence as to give a fasciate appearance, very finely punctate; humeral angles prominent, swollen, triangular, tips blunt; posterior process heavy and short, extending just beyond internal angles of tegmina, lighter in color at base than at tip, strongly carinate above, tip blunt and slightly deflexed; median carina not extending forward over metopidium; metopidium swollen in front, nearly flat on top.

Tegmina uniform ferruginous, nearly opaque, much wrinkled, very hairy at base and along veins.

Sides of thorax densely pubescent; undersurface of thorax and abdomen brown; legs entirely brown.

Length 3.7 mm.; width between humeral angles 2.5 mm.

Type: female (Baker's duplicate No. 8782).

Type locality: Singapore.

Described from two females, one from Singapore and one from the Island of Penang. Type in author's collection; paratype in Professor Baker's collection.

25. **Gargara nervosa**, sp. nov.

Apparently near *G. venosa* Walker from the Celebes (Walker, Journ. Linn. Soc. Zool. X: 189, 1868) and *G. carlafa* Distant from the Nilgiri Hills (Distant, Fauna British India App. 172, 3389, 1916).

Uniform brown, punctate, pubescent; tegmina mottled brown and white with veins very large and prominent.

Head wider than long; dark brown, closely punctate, finely pubescent; base irregularly sinuate; face sculptured; eyes large, brown; ocelli inconspicuous, amber-colored, about equidistant from each other and from the eyes and situated a little above a line drawn through centers of eyes; clypeus a little longer than wide, extending for more than half its length below inferior margin of face, tip truncate, slightly pubescent.

Prothorax brown, darker on metopidium and posterior process, closely and finely punctate, sparingly and irregularly pubescent; humeral angles weak, blunt; metopidium very convex as seen from above; median carina not percurrent but appearing only on the posterior process; posterior process short, extending just to the internal angles of the tegmina, slightly depressed at base, carinate above, tip blunt, dark and slightly depressed.

Tegmina hyaline, wrinkled; base brown and punctate; transverse brown fascia just behind base and another just below internal angles; veins very large, strong and prominent; tips more or less pointed, extending just beyond apex of abdomen.

Sides of thorax white tomentose; undersurface of body brown; legs brown.

Length 4.7 mm., width between humeral angles 2.4 mm.

Type: female (Baker's duplicate No. 8980).

Locality: Singapore.

Described from two females, both from Singapore. Type in author's collection; paratype in Professor Baker's collection.

26. **Gargara sordida**, sp. nov.

Dark, heavy-bodied; tegmina more or less blackened; posterior process extending just to internal angles of tegmina; sides of thorax more or less tomentose.

Head wider than long, black, sculptured, finely and closely punctate, sparingly pubescent with golden hairs; base irregularly sinuate; eyes very large, brown; ocelli small, white, glistening, farther from each other than from the eyes and situated far above a line drawn through centers of eyes, almost as high as tops of eyes; inferior margins of genae regularly sinuate; clypeus longer

than wide, extending for nearly half its length below inferior margin of face, tip rounded, hairy.

Prothorax very dark brown, almost black, punctate, densely pubescent with golden hairs; humeral angles prominent, swollen, blunt; metopidium convex; posterior process short, heavy, blunt, extending just to internal angles of tegmina, carinate above, pubescent; median carina prominent on posterior process, very faint behind center of pronotum and not visible on metopidium.

Tegmina dark, translucent, wrinkled; base black and punctate; white tomentose patch of thorax showing through just behind base; dark brown fascia just beneath internal angles and dark brown patch behind apex of posterior process; veins strong and prominent.

Sides of thorax more or less white tomentose. Undersurface of body black. Legs brown.

Length 4.8 mm.; width between humeral angles 2.5 mm.

Type: female. Male considerable smaller and darker.

Locality: Singapore.

Described from two males and two females, all from Singapore. Type, allotype and one paratype in Professor Baker's collection; one paratype in author's collection.

21. *Periaman* sp.

One specimen from the Island of Penang which belongs to the genus *Periaman* and is apparently new. The specimen is, however, considerably mutilated and does not warrant being made the type of a new species.

Some Peculiar Papuan Customs.

BY MISS L. S. GIBBS.

In 1913, in the course of Phytogeographical work at about 7 to 8,000 ft. in the ARFAK Mountains, of Dutch N. W. New Guinea, my carriers, both men and women, were drawn chiefly from the WARIAP and STARI, small "campongs" on the S. W. coast of GEELVINK Bay.

While on the March these people collected the leaves of *LAPORTEA* or *FLEURYA*, sp., tying them neatly into bundles. As soon as climbing began they constantly rubbed these leaves on forearms and legs to the knees with great zest and evident enjoyment. On another occasion during the ascent, the grandson of the "KORANO" or headman of WARIAP, a most active and intelligent young fellow, stood stoically while the skin of his calves was sliced in spirals, deep enough to let blood flow freely from each cut. This operation was performed by the Malay, or rather Timorese, sergeant (in charge of the escort kindly provided by the Dutch authorities) who thoughtfully explained beforehand what was about to happen. Beyond the fact that it was a peculiarity of the "PAPUAS" to suffer in the heat, I unfortunately did not gather the further drift of his remarks.

On the return journey, a young woman of STARI was brought up as "sakit prut" and given a good dose of Glauber's Salts. She appeared next morning to thank me for her recovery—her forearms and legs to the knees thickly smeared with faeces and accompanied by several companions similarly treated.

It would be interesting if readers of the "Asiatic Journal" could parallel similar instances amongst other native tribes, or possibly those ethnologically conversant with the customs of primitive peoples may be able to elucidate these examples.

APPENDIX I.

I have read with interest Miss Gibbs' note on "Some peculiar Papuan Customs" and amongst them I have noticed a Papuan Custom which corresponds with much similarity to a custom of the ARAWAKS and MACUSI Indians of British Guiana.

During several surveying journeys in that Colony, I have noticed that when on long journeys especially if carrying heavy baggage, the natives have often rubbed themselves with a kind of

nettle (KAMARI ?) in order they said to stimulate themselves, and give quicker action to the blood, and the same after a time gives them a most soothing effect, which enables them to carry on their work.

It is also done I understand for anyone suffering from back-ache, when the back is beaten with the nettle, until it sometimes bleeds.

W. R. HUMPHREYS, F.R.G.S.,

Lieut. R. F. A.

APPENDIX II.

Giraldus Cambrensis states that the Roman nettle *Urtica pilulifera* was introduced into Great Britain by the Romans under Julius Caesar. The soldiers brought some seed of it and sowed it at Romney for their use to rub and chafe their limbs when through extreme cold they should be stiff and benumbed, being told before they came from home that the climate of Britain was so cold that it was not to be endured without some friction to warm their blood. I cannot get any confirmation of this from any of the Greek and Latin authors, but it seems to be a parallel to the accounts of Miss Gibbs and Lieut. Humphreys, as to the use of urtication for relieving chill and stiffness in the limbs.

H. N. RIDLEY.

Hoseanthus Merrill, n. gen.

By H. N. RIDLEY, F.R.S., C.M.G.

In Journal No. 76, p. 114, Mr. Merrill gives as a New Genus *Hoseanthus* for my genus *Hosea* (Verbenaceae) on the ground that Dennstedt had previously published a genus *Hosea*. This is quite unnecessary additional synonym. Dennstedt got hold of a copy of Rheede's *Hortus Malabaricus* a work in several volumes of rather poor drawings of South Indian plants, and published a *Schlüssel zum Hortus Indicus Malabaricus* in 1818.

In cases where the drawing was so poor as to be not identifiable he gave it a new generic and specific name, but as no description whatever was published by him or even any suggestion as to the order of the plant these names rank as *nomina nuda* and are valueless. One of these plants was apparently a shrub which was so ill done that it is impossible to certainly identify it and to this sketch Dennstedt gave the name in his list of *Hosea*. Whatever the picture was intended to represent, it has doubtless long ere this received a properly accredited name and description, but I cannot find that any one has ever identified it and I do not know what it is meant for. Where the drawings in this work have been later identified Dennstedt's name has sometimes been retained, though as he did not ever describe one of them, the names were mere *nomina nuda* and might have been dropped. This being the case it is quite unnecessary to add to the ever increasing synonyms by substituting *Hoseanthus* for *Hosea* to retain the latter name for a plant which no one has ever identified and probably never will identify, and which the author Dennstedt never saw in his life nor I expect, would have recognized if he did see it. Dennstedt was evidently not so much a botanist as a compiler of lists; after publishing a *Flora of Weimar* in Germany he published about 4 compilations of lists of cultivated plants and the above mentioned *Schlüssel*, and nothing else. One cannot protest too strongly against the unnecessary increase of synonyms for plants. Scientifically it has no value at all and only adds to confusion, and bulk of literature for no useful purpose.

The Bornean Species of *Eugenia*, *Schefflera*, and *Saurauia*, represented in the Singapore Herbarium.

BY E. D. MERRILL.

Bureau of Science, Manila. P. I.

Through the kindness of Mr. I. H. Burkill, Director of the Botanic Garden, Singapore, I was recently loaned the Bornean material of the genera *Eugenia*, *Schefflera*, and *Saurauia* in the herbarium of that institution for study. My original request for this material was prompted chiefly by the idea that through a study of it I would be able specifically to determine a number of specimens of these three genera in the herbarium of the Bureau of Science which were inadequate or incomplete. On receiving the material, however, I found that although most of it comes from Sarawak, from the same general regions whence I have received most of my own Bornean material, comparatively few of the specimens match unidentified material in the herbarium of the Bureau of Science, and a number of sheets represent species entirely different from any of the named species in the latter herbarium. This fact impresses me with the belief that as yet the extant Bornean botanical material represents a relatively small part of the species that actually occur in Borneo, and that intensive field work in botany will add several thousand species to the list of those already recorded from this relatively little known Island. The results of my study of the Singapore material of the three genera under discussion are given below.

***Eugenia*, Linnaeus.**

An examination of the Bornean material representing this genus in the Singapore herbarium has induced me to propose and describe six new species, and to enumerate the specimens representing other species so far as I have been able to identify them. In addition to the twenty-seven species listed below at least eleven others are represented, but in most cases the material is scarcely sufficient to determine whether or not they represent described forms, and if described to which species they appertain. There are now about eighty-five species of the genus credited to Borneo; but the list will certainly be greatly extended. There are, in addition to the eleven Bornean species in the Singapore herbarium

that I cannot specifically determine, twenty others represented in the herbarium of the Bureau of Science by collections which I have not as yet found expedient to determine except generically: more than one-half of the known Bornean species are represented by named specimens in the latter herbarium.

Eugenia kuchingensis, Merr. in J. S. B., R. A. S. **77** (1917) 213.

SARAWAK, *Hariland s.n.*, January, 1889, June, 1888; Rejang, *Hariland 2921*, August, 1893.

Eugenia javanica, Lam., *Encycl.* **3** (1789) 200.

SARAWAK, Matang, *Ridley 12264*, August, 1905.

Eugenia saligna, (Miq.) C. B. Rob. in Philip. Journ. Sci. **4** (1909) Bot. 392.

LABUAN, January, 1886, collector not indicated; Kuching, *Hariland 2631*, March 1, 1893, a form with relatively broad leaves.

Eugenia rufo-tomentosa, (Gibbs) Merr. in J. S. B., R. A. S. **77** (1917) 223.

SARAWAK, Kuching, *Hariland 1698*, September, 1892, 979, the latter with rather larger leaves and longer flowers. Both of these specimens have larger leaves and shorter hairs than has Mrs. Clemens's Kinabalu material.

Jambosa conferta, Keith, in Nederl. Kruidk. Arch. **1** (1818) 202.

SARAWAK, Kuching, *Hariland s.n.*, March 27, 1893. The identification has been made from the rather imperfect description alone. The species as I have interpreted it can scarcely be distinguished from *Eugenia reticulata*, Wight.

Eugenia zeylanica, (Linn.) Wight, *lc.* **1** (1840) 13.

SARAWAK, *Hariland 67*; British North Borneo, Sandakan, *Ridley 9059*, December, 1897.

Eugenia lineata, (Blume) Duthie in Hook. f., *Fl. Brit. Ind.* **2** (1876) 487.

SARAWAK, *Hariland 67, s.n.*, May 20, 1893, 2927, and a specimen collected in August, 1884, collector not indicated.

Eugenia coralina, Merr. in J. S. B., R. A. S. **77** (1917) 207.

SARAWAK, near Kuching, *Hariland d. l. q. n.*, November, 1892, two sheets, one in flower, the other in fruit.

Eugenia elliptilimba, Merr. in J. S. B., R. A. S. **77** (1917) 211.

SARAWAK, Kuching, *Hariland* 1957, December, 1892.

Eugenia densiflora, (Blume) DC., Prodr. **3** (1828) 287.

BORNEO, without definite locality but probably from Sarawak, *Ridley* 12388, on river banks.

Eugenia chlorantha, Dalziel in Hook. f., Fl. Brit. Ind. **2** (1876) 487.

SARAWAK, Kuching, *Hariland* 2924, 2926, March, April, 1893, and three sheets without numbers.

Eugenia grandis, Wight, Hb. **2** (1841-50) 11.

SARAWAK, Rejang, *Hariland* 2927, June, 1893.

Eugenia ampullaria, Stapf in Trans. Linn. Soc. Bot. **4** (1894) 153, t. II, f. c 13.

BRITISH NORTH BORNEO, Mount Kinabalu, *Hariland* 1066, a cotype.

Eugenia besukiensis, (Hassk.) Merr. in J. S. B., R. A. S. **77** (1917) 226.

SARAWAK, near Kuching, *Hariland* 2091, January 11, 1893.

Eugenia operculata, Roxb., Fl. Ind. ed. 2, **2** (1832) 486.

SARAWAK, *Hariland*, 1893, the number illegible.

Eugenia myrtillos, Stuep in Trans. Linn. Soc. Bot. **4** (1894) 153.

BRITISH NORTH BORNEO, Mount Kinabalu, *Hariland* 1169, a cotype.

The form I credited to Mount Kinabalu as *Eugenia ngoensis*, C. B. Rob., in J. S. B., R. A. S. **77** (1917) 226, proves to be a fruiting specimen of Stapf's species. I can see no reason for distinguishing the two species and now believe that *E. ngoensis*, C. B. Rob. is identical with *E. myrtillos*, Stapf.

Eugenia baramensis, Merr. in J. S. B., R. A. S. **77** (1917) 218.

SARAWAK, Kuching, *Hariland* 1884, October, 1892.

Eugenia rugosa, (Korth.) Merr. in J. S. B., R. A. S. **77** (1917) 224.

SARAWAK, Braang, *Hariland* 107, December 21, 1888, on limestone.

Eugenia castanea, Merr. in J. S. B. R. A. S. **77** (1917) 212.

SARAWAK, Bergark, *Haviland* 122, January 8, 1889. The specimens differ from the type in having terete branchlets, while the bark is not at all flakey. These specimens much resemble Koorders's figure of *Eugenia ampliflora*, Koord. & Val.

Eugenia caudatilimba, Merr. in J. S. B. R. A. S. **77** (1917) 216.

SARAWAK, Kuching, *Haviland* 2925, April 13, 1893.

Eugenia alcinae, Merr. in Philip. Journ. Sci. **10** (1915) Bot. 216.

SARAWAK, Brooketon, *Haviland* 518, June 21, 1892;
BRUNEL, *Haviland* 6748 without date.

Eugenia kingii, sp. nov. § *Jambosa*.

Species *E. plumbea* affinis, differt foliis minoribus, nervis utrinque 5 vel 6.

A glabrous shrub, the branches terete, cinereous, the branchlets reddish-brown, rather slender, distinctly 4-angled, each internode thickened upward. Leaves opposite, chartaceous to subcoriaceous, lanceolate, 5 to 8 cm. long, 1.5 to 2.5 cm. wide, above brownish-olivaceous, smooth, shining, beneath paler, not punctate, narrowed upward to the rather slenderly acuminate apex and below to the obtuse to subacute base; lateral nerves 5 or 6 on each side of the midrib, prominent on the lower surface, somewhat ascending, anastomosing with the equally distinct marginal nerves about 2 mm. from the edge of the leaf, the reticulations distinct; petioles 2 to 3 mm. long. Cymes terminal, subsessile, 3- to 5-flowered, the rachis and very short branches 6 mm. long, or less. Flowers white, about 3 cm. in diameter, the calyx turbinate-infundibuliform, about 1.5 cm. long, narrowed below into a very short pseudostalk, the throat about 1.5 cm. in diameter; lobes reniform, coriaceous, 7 to 9 mm. wide. Styles slender, about 3.5 cm. long.

SARAWAK, Bongaya, *Ridley* 9071, December, 1897, "shrub, flowers white."

This specimen is mentioned by King¹ as being allied to *Eugenia plumbea*, King, from which it differs, however, in its smaller leaves, the lateral nerves being but one-half as many as in King's species.

Eugenia monantha, sp. nov. § *Jambosa*.

Arbor glabra, ramis teretibus, ramulis ultimis tenuibus, distincte 4-angulatis; foliis lanceolatis, epunctatis, chartaceis, usque ad 20 cm. longis, subolivaceis, nitidis, sursum gradatim

angustatis, longe et tenuiter subcaudato-acuminatis, interdum leviter falcatis, basi angustatis, acutis vel subobtusis; nervis lateralibus utrinque 12—14, subtus perspicuis, prominulis, anastomosantibus; *floribus* terminalibus, solitariis, circiter 5 cm. diametro, pedicellatis; calycibus late infundibuliformibus, tubo circiter 2 cm. longo.

A glabrous tree the branches slender, terete, the ultimate internodes distinctly 4-angled, slender, 2 mm. in diameter or less. Leaves lanceolate, sometimes slightly falcate, chartaceous, subolivaceous, 12 to 20 cm. long, 2 to 4.5 cm. wide, gradually narrowed upward to the long and slenderly acuminate apex, the acumen often distinctly caudate and up to 2.5 cm. in length, and below to an acute or somewhat obtuse base; primary lateral nerves 12 to 14 on each side of the midrib, prominent on the lower surface, somewhat curved, anastomosing with the equally distinct marginal nerves 3 to 4 mm. from the edge of the leaf, the latter slightly arched between the anastomoses, the reticulations rather close, distinct under a lens; petioles 4 to 8 mm. long. Flowers terminal, solitary, rather large, in anthesis about 5 cm. in diameter, their pedicels 1 to 2 cm. long, distinctly jointed to the calyx. Calyx broadly funnel-shaped, the throat about 1.5 cm. in diameter, the lobes suborbicular-reniform, subcoriaceous, about 8 mm. in diameter, the tube rather abruptly narrowed below forming a short pseudostalk. Style slender, about 3.5 cm. long.

SARAWAK, Rejang, *Hariland* 2146, November, 1892.

This species is strongly characterized by its lanceolate, slenderly acuminate leaves which distinctly resemble those of *Eugenia jambos*, Linn.; its slender terete branches and distinctly 4-angled ultimate internodes of the branchlets; and the large, solitary, terminal, pedicelled flowers. It apparently belongs in the group of *Eugenia jambos*, Linn., but is not closely allied to that species.

Eugenia subracemosa*, sp. nov. § *Jambosa

Arbor glabra, ramulis rugosis, distincte angulatis; *foliis* oppositis, coriaceis, in siccitate utrinque purpureo-brunneis, nitidis, coriaceis, oblongis vel oblongo-obovatis, utrinque subaequaliter angustatis, petiolatis, basi acutis vel acuminatis, apice acuminatis, usque ad 18 cm. longis, margine recurvatis, supra impresso-punctulatis, nervis utrinque circiter 10, adscendentibus, perspicuis, juxta marginem anastomosantibus, reticulis obsoletis; *inflorescentiis* brevibus, subracemosis, paucifloris, fasciculatis, e tuberculis in ramis vetustioribus, usque ad 3 cm. longis; *floribus* brevissime pedicellatis; *calycis* tubo turbato, circiter 3 mm. longo et 4 mm. diametro, deorsum angustato; *petalis* 4, liberis, circiter 4 mm. longis.

A glabrous tree, the branches and branchlets grayish to reddish-brown, rugose, the latter distinctly 4-angled, 3 to 3.5 mm. in diameter. Leaves opposite, coriaceous, when dry purplish-brown on both surfaces, shining, the upper surface smooth, minutely impressed-punctulate, the lower epunctate, oblong to oblong-obovate, 14 to 18 cm. long, 6 to 7 cm. wide, subequally narrowed to the acute or somewhat acuminate base and to the acuminate apex, the margins recurved; lateral nerves about 10 on each side of the midrib, distinct but only slightly projecting on the lower surface, ascending, anastomosing directly with the equally distinct marginal nerves 2 to 3 mm. from the edge of the leaf, the latter slightly arched between the anastomoses, the reticulations obsolete; petioles thickened, nearly black, rugose, up to 1 cm. in length. Inflorescences up to 3 cm. in length, subracemose, simple, fascicled, each usually 5-flowered, on the older branches, at least always below the leaves, each rachis usually with two lateral and three terminal flowers, the pedicels very short, not exceeding 2 mm. in length. Flowers, including the stamens, 10 to 12 mm. in diameter and about 8 mm. long. Calyx turbinate, the tube narrowed below, about 3 mm. long, the throat about 4 mm. in diameter; lobes 4, ovate, rounded, 2 mm. long. Petals 4, free, about 4 mm. long, elliptic to elliptic-obovate. Stamens very numerous.

SARAWAK, Kuching, *Hariland* 2928, March 14, 1893.

In aspect this species somewhat resembles *Eugenia polyccephala*, Miq., but is not closely allied to that species, differing radically in its vegetative characters and in its short, fascicled, few-flowered inflorescences.

Eugenia subsessilifolia*, sp. nov. § *Jambosa

Arbor glabra, ramis ramulisque laevibus, teretibus, subcastaneis; foliis oppositis, coriaceis, oblongis, epunctatis, usque ad 13 cm. longis, apice perspicue sed obtuse acuminatis, basi late rotundatis, distincte cordatis, subamplexicaulibus, sessilibus vel subsessilibus, supra in siccitate obscure olivaceis, subtus rubro-brunneis; nervis primariis utrinque circiter 12, subtus distinctis, anastomosantibus; inflorescentiis cymosis, axillaribus terminalibusque, brevibus, circiter 2.5 cm. longis, axillaribus paucifloris, terminalibus densifloris; floribus circiter 1.8 cm. longis, 4-meris; calycis tubo deorsum gradatim angustato.

A glabrous tree, the branches and branchlets smooth, subcastaneous, somewhat shining, terete, the nodes somewhat thickened. Leaves oblong, coriaceous, not punctate, the upper surface dark-olivaceous somewhat shining, the lower reddish-brown when dry, sessile or subsessile, 10 to 13 cm. long, 4 to 5 cm. wide, apex rather prominently but bluntly acuminate,

base broadly rounded and distinctly cordate, subamplexicaul; midrib impressed on the upper surface, prominent beneath; lateral nerves about 12 on each side of the midrib, somewhat curved, slender, distinct, slightly projecting on the lower surface, anastomosing with the subequally distinct and slightly arched marginal nerves about 5 mm. from the edge of the leaf. Inflorescences short, cymose, axillary and terminal, the rachis of the lateral inflorescences solitary, less than 1 cm. long, usually 2- or 3-flowered, the terminal inflorescences about 2.5 cm. long, including the flowers, dense, the whole inflorescence about 4 cm. in diameter, the branches about 1 cm. long, each usually 3-flowered. Flowers about 1.8 cm. long and nearly as wide in anthesis, when dry dark-brown. Calyx-tube at least 1 cm. long, gradually narrowed below forming a pseudostalk, sessile, in bud clavate. Sepals orbicular-reniform, about 4 mm. wide. Petals ovate, about 5 mm. long. Filaments numerous, up to 8 mm. in length.

SARAWAK, near Kuching, *Hariland* 2923, February 6, 1893 "petals and sepals callicous."

The alliance of this species is apparently with the Javan *Eugenia hypericifolia*, (Blume) Koord. & Val., from which it is distinguished not only by the shape and apparently less distinct venation of its leaves, but also by its many-flowered inflorescences and clavate eglandular buds.

Eugenia lunduensis*, sp. nov. § *ambosa

Arbor glabra, ramis ramulisque teretibus vel ramulis leviter compressis vel sulcatis; foliis sessilibus vel brevissime petiolatis, chartaceis, oblongo-ellipticis, usque ad 20 cm. longis, acuminatis, basi rotundatis, leviter cordatis, epunctatis, supra olivaceo-brunneis, laevibus, nitidis, subtus pallidis; nervis utrinque circiter 15, subtus valde prominulis, leviter curvatis, cum nervis marginalibus valde distinctis anastomosantibus; inflorescentis terminalibus, brevissimis, depauperato-cymosis, paucifloris; floribus confertis; calyce circiter 1 cm. longo, deorsum angustato, lobis patulis; petalis suborbicularibus, liberis.

A glabrous tree, the branches and branchlets terete, smooth, pale-brownish, or the ultimate branchlets somewhat compressed or sulcate, never angled, about 3 mm. in diameter. Leaves opposite, chartaceous, oblong-elliptic, sessile or subsessile, 18 to 20 cm. long, 7 to 9 cm. wide, epunctate, subequally narrowed upward to the acuminate apex and below to the rounded and somewhat cordate base, the upper surface olivaceous-brownish, smooth, somewhat shining, the nerves usually slightly impressed, the lower surface pale, shining; lateral nerves about 15 on each side of the midrib, very prominent, slightly curved, anastomosing with the equally distinct, nearly straight

or slightly arcuate marginal nerves about 5 mm. from the edge of the leaf. Cymes depauperate, terminal, the axis and very short branches 5 mm. long or less, the base with several pairs of lanceolate, acuminate, stiff, 5 mm. long bracts, the bracteoles subtending the flowers oblong-ovate, 1.5 mm. long; the pedicels about 2 mm. long. Calyx-tube about 1 cm. long, the limb somewhat spreading, and 8 to 9 mm. in diameter, excluding the lobes, narrowed below, somewhat funnel-shaped; lobes ovate, rounded, sparsely punctate, 4 to 5 mm. long. Petals 4, free, orbicular, about 6 mm. long. Filaments about 6 mm. long (from unopened buds). Styles about 1.5 cm. long.

SARAWAK, Lundu, Mount Gadug, *Haviland* 985, 1892.

The alliance of this species is manifestly with *Eugenia pseudo-formosa*, King, from which it differs chiefly in its somewhat smaller, fewer-nerved leaves and in its distinctly smaller flowers. Another allied species is *Eugenia serangu-lata*, (Miq.) Koord. & Val., which differs from the present species, among other characters in its angular branchlets.

***Eugenia rhynchophylla*, sp. nov. § *Syzygium*.**

Arbor glabra, ramis ramulisque tennibus, teretibus, pallidis: *foliis* chartaceis vel subcoriaceis, oblongis vel oblongo-ellipticis, usque ad 10 cm. longis, perspicue subcaudato-vel rostrato-acuminatis, basi acutis vel leviter acuminatis, in sic-citate olivaceis vel brunneo-olivaceis, nitidis, supra minute im-presso-puncticulatis, subtus sub lente perspicue punctatis, nervis primariis utrinque circiter 10, irregularibus, distantibus, patulis, leviter curvatis, anastomosantibus, reticulis obsoletis vel subobsoletis; *inflorescentiis* depauperato-cymosis, pauci-floris, solitariis vel fasciculatis, axillaribus et terminalibus, usque ad 5 mm. longis; *floribus* obovoideis, circiter 3 mm. longis, sessilibus vel subsessilibus; *petalis* connatis, calyptratum deciduis.

A glabrous tree with slender, terete, pale, smooth branches and branchlets 1.5 to 2 mm. in diameter. Leaves opposite, chartaceous or subcoriaceous, brittle, olivaceous to brownish-olivaceous on both surfaces and somewhat shining when dry, oblong to oblong-elliptic, 8 to 10 cm. long, 3 to 4 cm. wide, the apex conspicuously subcaudate- or rostrate-acuminate, the acumen blunt, about 1 cm. long, the base acute to somewhat acuminate, the upper surface minutely impressed-punctulate, the lower distinctly punctate under a lens; lateral nerves about 10 on each side of the midrib, spreading, slightly curved, prominent and projecting on the lower surface, usually im-pressed on the upper surface, distant, rather irregular, anasto-mosing with the equally distinct marginal nerves 2 to 4 mm. from the edge of the leaf, the lateral nerves somewhat arched between the anastomoses, the reticulations obsolete or subob-

solete: petioles 5 to 8 mm. long. Cymes depauperate, few-flowered, axillary and terminal, solitary or few in a fascicle, 5 mm. long or less, the rachis short, usually with two short lateral branchlets, each bearing one flower. Flowers obovoid, about 3 mm. long, sessile or subsessile, the limb very slightly produced, truncate. Petals wholly united into a deciduous calyptra about 1.5 mm. in diameter. Stamens numerous, their filaments very short.

SARAWAK, Kuching, *Haviland 2930*, May 19, 1893.

This species is especially well characterized by its slender, terete, pale branches and branchlets, the internodes 3 to 9 cm. in length, and its very short, few-flowered, depauperate, axillary and terminal cymes, which do not exceed the petioles in length. It differs radically from *Eugenia baramensis*, Merr., another Bornean species that has very short, few-flowered cymes not only in its vegetative characters but also in its pale, terete, not 4-angled branches and branchlets.

Schefflera, Forster.

Six species of this genus were definitely known from Borneo, and an examination of the material in the Singapore herbarium has enabled me to increase the list to ten. Of the previously described species I was able to match but two in the Singapore herbarium, these being *Schefflera tetrandra*, Merr., represented by *Ridley 12251* from Matang, and *Haviland s.n.* from Kuching, and *S. borneensis*, Merr., represented by a Kuching specimen probably collected by *Haviland*. There are four additional species in the Singapore herbarium, and five in the Bureau of Science herbarium, making a total of nineteen Bornean species; however, as the material representing these additional nine species is decidedly inadequate in each case, I do not consider it advisable to attempt to carry the classification beyond the genus at the present time.

Schefflera borneensis, sp. nov.

Arbor parva, inflorescentis perspicue brunneo-furfuraceis: foliis longe petiolatis, 8- vel 10-foliolatis, foliolis oblongis, integris, coriaceis, usque ad 26 cm. longis, breviter acuminatis, basi obtusis vel acutis, nervis utrinque circiter 12, utrinque cum reticulis distinctis: inflorescentis ut videtur terminalibus, ramis primariis numerosis, confertis, racemose dispositis, usque ad 20 cm. longis: umbellis numerosis, tenuiter pedunculatis, 15—20-floris: floribus parvis, 5-meris: petalis extus parvis et minutissime furfuraceis, ovatis, circiter 2 mm. longis: tractibus circiter 4 mm. longis, subellipsoideis, acute 5-angulatis, sulcatis.

A small tree, glabrous except the conspicuously brown-furfuraceous inflorescences. Branches apparently thickened.

Leaves palmately 8- to 10-foliolate, their petioles up to 43 cm. long; leaflets coriaceous, pale or pale-brownish when dry, somewhat shining, oblong, 18 to 26 cm. long, 6 to 8 cm. wide, apex shortly acuminate, base obtuse to acute; primary lateral nerves about 12 on each side of the midrib, rather distinct although but slightly projecting on both surfaces as are the rather close reticulations, curved, anastomosing; petiolules 3.5 to 8 cm. long, somewhat thickened at their apices. Inflorescence apparently terminal, consisting of numerous, elongated, racemously arranged, crowded primary branches about 40 cm. in length, each subtended by a coriaceous, lanceolate to ovate-lanceolate, acuminate, 3 cm. long, furfuraceous bract. Umbels numerous, 15- to 20-flowered, their peduncles slender, in anthesis 1.5 to 2 cm. long, each subtended by an oblong, about 5 mm. long, deciduous, bract, the pedicels up to 4 mm. in length, all parts brown-furfuraceous. Flowers 5-merous; the calva funnel-shaped, about 1.8 mm. in diameter, 5-toothed, the teeth lanceolate-acuminate from a broad base, about 0.5 mm. long. Petals ovate, 2 mm. long, externally minutely and sparingly furfuraceous. Fruits ellipsoid, about 4 mm. long, prominently and sharply 5-angled, 5-sulcate.

SARAWAK, Kuching, *Haviland 2948* (type), January 25, 1893, "small tree, flowers yellow: *Native collector 1060 Bur. Sci.*

This species is strongly characterized by its numerous, coriaceous, entire leaflets, the petioles being unusually long, and its numerous, crowded, greatly elongated primary branches of the inflorescences which are conspicuously brown-furfuraceous throughout and about 40 cm. in length. Haviland's specimen presents ten of these primary branches, manifestly but a part of those from a single inflorescence.

***Schefflera burkillii*, sp. nov.**

Frutex glaber; *foliis* 5—3-foliolatis, foliolis coriaceis, olivaceis, oblongis ad oblongo-ellipticis, integris, usque ad 10 cm. longis, acutis vel leviter acuminatis, basi acutis, nervis utrinque circiter 10, tenuibus, reticulis distinctis; *inflorescentiis* terminalibus, brevissime pedunculatis, circiter 5 cm. longis, ramis primariis usque ad 4, subumbellatum dispositis; *umbellis* in ramis singulis usque ad 7, pedunculatis, 10—15-floris; *floribus* pedicellatis, 6-meris, petalis circiter 2.8 mm. longis.

A glabrous shrub, the branches rugose when dry, about 5 mm. in diameter, dark-colored. Leaves 5- to 3-foliolate, their petioles about 4 cm. long, inflated at the base, the narrow margins of the inflated part somewhat recurved, not appressed to the branches. Leaflets coriaceous, olivaceous when dry, oblong to oblong-elliptic, 8 to 10 cm. long, 3.5 to 4 cm. wide, entire, base acute, apex acute to somewhat acuminate, mar-

gins entire; lateral nerves about 10 on each side of the midrib, slender, nearly straight, anastomosing, the reticulations rather close and distinct; petiolules 1 to 1.5 cm. long. Inflorescences very shortly peduncled, terminal, about 5 cm. long, the primary branches up to 4, subumbellately disposed near the apex of the peduncle, each bearing up to 7 umbels, in some the umbels mostly near the tips of the branchlets, in others racemously disposed. Umbels 10- to 15-flowered, their peduncles 8 to 12 mm. long. Flowers 6-merous, their pedicels 2 to 4 mm. long. Calyx somewhat funnel-shaped, truncate, 2.4 mm. in diameter. Petals oblong, acute, about 2.8 mm. long. Anthers 6.

SARAWAK, Matang road, *Native collector 892 Bur. Sci.* (type), August 11, 1911; Matang, June 14, 1893, from the Sarawak Museum, apparently collected by *Haviland*.

Among the Bornean species this is apparently most closely allied to *Schefflera polita*, (Miq.) Viguier, but differs in numerous characters, notably in its entirely different stipules, which in this species are reduced to a recurved narrow rim distant from the branchlet.

***Schefflera havilandii*, sp. nov.**

Frutex vel arbor parva, glabra: *foliis* longissime petiolatis, foliolis 7—9, oblongis, coriaceis, in siccitate brunneo-olivaceis, nitidis, laevibus, usque ad 18 cm. longis, integris, abrupte et breviter acuminatis, basi acutis vel rotundatis, nervis utriusque circiter 7, tenuibus, curvatis vel adscendentibus, saepe indistinctis, reticulis obsoletis; *inflorescentiis* ut videtur terminalibus, ramis primariis (numerosis?) valde elongatis, usque ad 45 cm. longis; *umbellis* numerosis, in ramis primariis racemose dispositis, pedunculatis, circiter 8-floris; *fructibus* junioribus obovoideis, truncatis, circiter 3 mm. longis, deorsum angustatis, basi acutis, irregulariter rugosis, 6-locellatis.

A shrub or a small tree, glabrous. Leaves palmately 7- to 9-foliolate, their petioles at least 30 cm. long; leaflets coriaceous, oblong, entire, brownish-olivaceous, shining, smooth, the apex rather abruptly and shortly acuminate, base acute to rounded, 16 to 18 cm. long, 5 to 7 cm. wide; primary nerves about 7 on each side of the midrib, slender, often indistinct, ascending or curved, the reticulations obsolete; petiolules 3 to 6 cm. long. Inflorescences apparently terminal and composed of several (many?) greatly elongated primary branches, these up to 45 cm. in length, the lower parts naked, the upper two-thirds to three-fourths of each with numerous, racemously disposed, about 8-flowered umbels, their peduncles 1 to 1.5 cm. in length. Pedicels about 5 mm. long. Young fruits obovoid, truncate, narrowed below to the acute base, irregularly rugose, about 3 mm. long, 6-celled.

SARAWAK, near Kuching, *Hariland's collector* 192, November 23, 1892; *Hariland* 2947, March 22, 1893.

At first glance this species resembles *Schefflera borneensis*, Merr., but is readily distinguished by its smooth leaflets in which the reticulations are obsolete, and its glabrous inflorescences. It probably has the same type of inflorescence as the latter, but the specimens available do not show its true characters, the primary branches being detached.

***Schefflera racemosa*, sp. nov.**

Frutex, inflorescentius floribusque cinereo-puberulis: *foliis* longissime petiolatis, 6-foliolatis, foliolis in siccatate pallidis, subcoriaceis, oblongis, usque ad 25 cm. longis, acuminatis, basi obtusis, margine perspicue distanter serratis vel subintegris, nervis utrinque circiter 6, subtus valde prominulis, curvatis, arcuato-anastomosantibus, reticulis laxissimis: *inflorescentiis* breviter pedunculatis, ramis circiter 3, circiter 25 cm. longis: *floribus* in fasciculis distantibus dispositis, breviter pedicellatis, plerumque 8-meris: *petalis* oblongo-ovatis, circiter 3 mm. longis, extus puberulis.

A shrub, glabrous except the cinereous-puberulent inflorescences and flowers, the branches up to 1 cm. in diameter. Leaves 6-foliolatis, their petioles 35 to 40 cm. in length, the petiolules 2 to 8 cm. long, the exterior ones shorter than the central ones; leaflets pale when dry, subcoriaceous, oblong, 18 to 25 cm. long, 5 to 10 cm. wide, narrowed below to the obtuse base and above to the rather slenderly acuminate apex, the margins distantly and rather prominently serrate to subentire; lateral nerves about 6 on each side of the midrib, distant, lax, curved, arcuate-anastomosing, very prominent on the lower surface, the reticulations very lax. Inflorescences apparently in the uppermost axils, usually 3-branched, shortly peduncled, the peduncles 3 cm. long or less, the branches usually about 25 cm. long. Flowers in distant fascicles on the primary branches, usually six or less in a fascicle, each fascicle subtended by an ovate-lanceolate, acuminate, puberulent, deciduous bract 5 mm. long or less; the pedicels puberulent, 2 mm. long or less. Calyx funnel-shaped, truncate or obscurely denticulate, about 3 mm. in diameter and 2 mm. long, puberulent. Petals 7 to 9, usually 8, oblong-ovate, acute, about 3 mm. long, externally puberulent. Stamens as many as the petals. Fruits unknown.

SARAWAK, Bau, *Ridley* 11775 (type), July, 1893, *Anderson* 49, August, 1912; Braang, *Hariland* 35, November, 1888; Mount Sudan, *Nature collector* 2042 *Bur. Sci.*

This species is well characterized by its long-petioled leaves, prominently nerved leaflets, and by its characteristic

inflorescences, the primary branches usually three in number, cinereous-puberulent, and the shortly pedicelled, usually 8-merous flowers being arranged in distant, few-flowered fascicles, not in umbels.

***Saurauia*, Willdenow.**

Saurauia planchonii, Hook. f. in Trans. Linn. Soc. **23** (1860) 161.

SARAWAK, near Tegora, *Hariland 2048* and a sheet without number indicated as "*= 2048*"; Kuching, *Hariland*, indicated as "*= 764*" (inflorescences immature); Matang, *Ridley*; Bau, *Ridley 11185*, "epiphyte, flowers red"; Tambusan, *Ridley*.

A characteristic endemic species.

Saurauia heterosepala, Merr. in Philip. Journ. Sci. **13** (1918) Bot.

SARAWAK, near Kuching, *Hariland 27* and *s.n.*, March, 1893. The specimens differ in a few minor details from the type but I think represent this species.

Saurauia oblancifolia, Merr. nom. nov.

Saurauia oblanceolata, Merr. in Philip. Journ. Sci. **13** (1918) Bot. 92, non *Ridley*, 1916.

SARAWAK, Bongaya, *Ridley 9076*, December, 1897, "shrub, flowers white, said to be irritating." The specimen agrees closely with the type.

Saurauia ferox, Korth., Verh. Nat. Gesch. Bot. (1839-42) 132, t. 30.

SARAWAK, *Hariland s.n.* Apparently typical of this endemic species.

Saurauia amoena, Stapf in Trans. Linn. Soc. Bot. **4** (1894) 134.

BRITISH NORTH BORNEO, Mount Kinabalu, *Hariland 1361*, a cotype of this endemic species.

In addition to the above and those described below, there is in the herbarium also a species indicated under an as yet unpublished name proposed by Stapf, represented by four specimens, and an apparently undescribed species represented by a rather inadequate specimen from Gaya, collector not indicated but probably *Ridley*.

Saurauia glabra, sp. nov.

Frutex glaber; *foliis* coriaceis, in siccitate olivaceis, nitidis, subtus brunneis vel castaneis, plerumque oblongis, usque

ad 18 cm. longis, breviter acummatiss, basi acutis, margine crenulatis, nervis utrinque 8—10, distinctis; *floribus* e ramis defoliatis, solitariis vel binis, glabris, longe pedicellatis; *sepalis* valde inaequalibus, exterioribus ellipticis, circiter 6 mm. longis, interioribus latissime ovatis vel suborbicularibus, circiter 8 mm. longis; *ovario* glabro; stylis 3, circiter 9 mm. longis, basi leviter connatis.

A shrub, glabrous throughout, or the very youngest parts slightly furfuraceous, soon becoming entirely glabrous. Leaves mostly oblong, coriaceous, 10 to 18 cm. long, 4 to 7 cm. wide, usually olivaceous when dry, the lower surfaces brownish to castaneous, shining, the apex shortly and rather obtusely acuminate, base acute, margins crenulate; lateral nerves 8 to 10 on each side of the midrib, prominent; petioles 2 to 3 cm. long. Flowers on the branches below the leaves, solitary or in pairs, their pedicels ultimately 3 cm. in length (in young fruit) in bud shorter, each with one or two ovate, obtuse bracts in the lower part 1 mm. long or less. Sepals glabrous, unequal, the outer two elliptic, about 6 mm. long and 3.3 mm. wide, the inner three broadly ovate to suborbicular, about 8 mm. long. Corolla about 12 mm. long, the lobes 9 by 6 mm., the apex truncate-rounded and retuse. Stamens about 30. Ovary glabrous; styles 3, glabrous, about 9 mm. long, united for the lower 1 to 2 mm.

SARAWAK, Matang, *Haviland s.n.*, August, 1888 (type). Penkuku, *Haviland s.n.*, near Kuching, *Haviland 1004*, January 19, 1892 (with some of the leaves obovate), *Native collector 256, 555, 2495 Bur. Sci.*

This species greatly resembles *Saurauia nudiflora*, DC., of the Malay Peninsula, Sumatra, and Java, but is at once distinguished from it by its 3, not 5 styles; it differs also in various other characters.

***Saurauia spinuloso-setosa*, sp. nov.**

Frutex vel arbor parva, ramis et totis utrinque et inflorescentibus perspicue curvato-spinuloso-setosis, setis plerumque subpatulis, ferrugineis vel subferrugineis; *foliis* chartaceis, ellipticis vel ovato-ellipticis, usque ad 17 cm. longis, in siccitate supra castaneis, subtus pallidioribus, apice tenuiter caudato-acummatiss, basi saepe leviter maequilateralibus, obtusis vel rotundatis, margine perspicue spinulosiss, nervis utrinque circiter 15, perspicuis; *cymis* axillaribus, solitariis vel fasciculatis, subsessilibus vel breviter pedunculatis, paucifloris; *bracteis* linearibus, 4 ad 6 mm. longis, setosis; *sepalis* setosis, oblongo-ovatis, acutis, circiter 5.5 mm. longis; *antheris* circiter 30; *ovario* glabro, stylis 3, liberis, glabris, 3 mm. longis.

A shrub or small tree, all parts prominently spinuloso-setose with brownish to ferrugineous, usually spreading, curved

setae 2 to 5 mm. in length. Leaves chartaceous, elliptic to ovate-elliptic, 11 to 1½ cm. long, 5.5 to 8 cm. wide, the apex slenderly caudate-acuminate, the acumens usually about 2 cm. in length, the base often somewhat inequilateral, obtuse to rounded, the margins prominently spinulose-setose, the upper surface castaneous, with numerous, scattered, curved, rather short setae, the lower surface pale-brownish, densely setose on the midrib and nerves, with fewer and smaller setae on the reticulations; lateral nerves about 15 on each side of the midrib, prominent, curved; petioles 1 to 2 cm. long, densely setose. Cymes axillary, solitary or fascicled, few-flowered, 2 cm. long or less, all parts prominently setose, the peduncles 8 mm. long or less, the pedicels slender, 6 to 10 mm. long; bracts linear, 4 to 6 mm. long, densely setose. Sepals about 5.5 mm. long, setose, oblong-ovate, acute. Corolla-lobes oblong, about 6 mm. long, 2.5 mm. wide, apex truncate-rounded, not or but obscurely retuse. Stamens about 30. Ovary glabrous; styles 3, free, glabrous, 3 mm. long.

SARAWAK, Kalaka, April 17, 1893, collector not indicated, but probably *Hariland*.

This species is prominently characterized by its numerous, slender, usually spreading, curved setae which are present on all the vegetative parts; its slenderly caudate-acuminate, prominently spinulose leaves which are castaneous above when dry and pale-brown beneath; and its few-flowered, axillary cymes. It is probably as closely allied to *Saurauia acuminata*, Merr., as to any other described form but is radically different from that species.

***Saurauia ridleyi*, sp. nov.**

Frutex vel arbor parva, ramis teretibus, glabris, ramulis junioribus densissime longe subadpresso setosis; *foliis* chartaceis, oblongis, oblongo-obovatis, vel oblongo-oblanceolatis, plerumque utrinque subaequaliter angustatis, apice tenuiter acuminate, basi acutis vel obtusis, usque ad 3½ cm. longis, margine spinulosis, supra glabris, subtus ad costam nervosque spinulosis, nervis utrinque 15 ad 20, perspicuis; *floribus* fasciculatis, axillaribus vel e ramis vetustioribus, pedicellis ciliatis, hirsutis; *sepalis* extus parce hirsutis, circiter 4 mm. longis; *petalis* oblongis, obtusis; *ovario* glabro; *stylis* 3, tomentosis, circiter 3 mm. longis, in ¼ inferiore parte connatis.

A shrub or a small tree, the tips of the branchlets and the younger petioles densely subappressed-setose with slender, brownish to fulvous setae up to 5 mm. in length, the branches terete, glabrous. Leaves chartaceous, oblong, oblong-obovate, or broadly oblong-oblanceolate, for the most part subequally narrowed to base and apex, 15 to 3½ cm. long, 7 to 11 cm. wide, the apex slenderly acuminate, the base acute to somewhat

obtuse, the upper surface entirely glabrous, pale-olivaceous, shining, the lower rather prominently curved-setose on the midrib and lateral nerves and otherwise somewhat hirsute, the margins spinulose, the slender teeth appressed or incurved; lateral nerves 15 to 20 on each side of the midrib, prominent, curved, the reticulations distinct, subparallel; petioles 1.5 to 4 cm. long, when young rather densely curved-setose like the branchlets, in age glabrous or nearly so. Flowers fascicled, axillary and on the older branches below the leaves, few to as many as 15 in a fascicle, the slender pedicels up to 12 mm. in length, ferruginous-hirsute. Sepals elliptic-oblong to ovate, acute, about 4 mm. long, externally slightly hirsute. Corolla-lobes oblong, obtuse or rounded, equilateral, about 4 mm. long and 2 mm. wide. Stamens about 20, the anthers 2.5 to 3 mm. long. Ovary glabrous. Styles 3, tomentose, about 3 mm. long, united for the lower 1 mm.

SARAWAK, Lundu, *Ridley 12259* (type), September, (1894 ?) Mataaz, *Hollett, s.n.*, *Ridley 12259*, August, 1893.

This species is well characterized by its rather densely incurved-setose branchlets and petioles, the midrib and lateral nerves on the lower surface of the leaves with similar setae, and its fascicled, slenderly pedicelled flowers with glabrous ovaries and tomentose styles.

Saurauja havilandii, sp. nov.

Frutex vel arbor parva, partibus junioribus inflorescentibusque exceptis glaber vel subglaber; ramis teretibus, glabris, ramulis parce adpresse squamosis; *foliis* chartaceis, oblongis vel oblongo-ovatis, usque ad 25 cm. longis, tenuiter acute acuminatis, basi acutis, margine breviter subadpresse serratis, supra glabris, subtus pallidis, glabris, vel ad costa parvisissime adpresse squamosis, nervis utrinque 15—18, perspicuis; petiolo 3 ad 4 cm. longo; *paniculis* terminalibus vel ex axillis superioribus, pedunculatis, solitariis, pedunculatis, multifloris, usque ad 20 cm. longis, dense adpresse squamoso-setosis, squamis vel setis brevibus; *floribus* parvis; *sepalis* 2.5 ad 3 mm. longis, exterioribus extus adpresse setosis; *antheris* 10; *ovario* glabro; *stylis* 3, distincte tomentosis, ad basi leviter connatis, 2 mm. longis.

A shrub or small tree, glabrous or nearly so except the very young parts and the inflorescences. Branches terete, dark reddish-brown, glabrous, the branchlets with few, closely appressed, short, thick scales. Leaves chartaceous, oblong to oblong-ovate, 11 to 25 cm. long, 6 to 10 cm. wide, narrowed upward to the slenderly and acutely acuminate apex, the acumens sometimes subcaudate and up to 2.5 cm. long, the base acute to subobtuse or broadened as to be almost rounded, the margins with small, closely appressed, short, thickened, sharp

teeth, the upper surface blackish when dry, glabrous, the lower pale, glabrous, or the midrib with very few appressed scales; lateral nerves 15 to 18 on each side of the midrib, prominent, curved, anastomosing, the reticulations subparallel, distinct; petioles 3 to 4 cm. long, glabrous or nearly so. Panicles solitary, terminal or in the uppermost axils, peduncled, up to 20 cm. long, many-flowered, the peduncles 4 to 6 cm. long, with few, appressed scales, the lower branches up to 7 cm. in length, these with the branchlets and the rachis rather densely appressed setose-scaly, the setae or scales brownish, short. Flowers numerous, small, their pedicels 2 to 3 mm. long, the bracts linear-lanceolate, 2 mm. long or less, appressed-setose. Sepals thin, elliptic-ovate, acute to obtuse, externally sparingly appressed-setose, 2.5 to 3 mm. long. Corolla-lobes elliptic, rounded, 3.5 to 4 mm. long, not retuse. Anthers 10, about 2 mm. long. Ovary globose, glabrous; styles 3, distinctly tomentose, about 2 mm. long, slightly united below.

SARAWAK, Braang, *Haviland s.n.*, November, 1888.

In general appearance this species resembles *Saurauia planchonii*, Hook. f., and is manifestly allied to it. It can be readily distinguished by its leaves being entirely glabrous beneath or at most with but few, closely appressed scales on the midrib.

The Circumstances attending the Murder in 1859, of the Botanist James Motley.

BY I. H. BURKILL.

In Britten and Boulger's useful *Biographical Index of British and Irish Botanists* (London, 1893) the following is the entry regarding James Motley, its abbreviations expanded for clearness:—

MOTLEY, JAMES. (fl. 1847-55). Murdered in Borneo by Mohammedan settlers. Of Aberafon, Glamorganshire, and afterwards of Labuan. Contrib.[utor] to Phyt.[ologist] ii. (1847) and Journ.[al of] Bot.[any], 1847 and [of] Carmarthen plants to Top.[ographical] Bot.[any], (551). Collected in Malaya, 1852-55. [Published] "Contrib.[utions] to [the] Nat.[ural] Hist.[ory] of Labuan" (with L. L. Dillwyn), 1855. Plants [collected by him are] at Kew. [Vide] Linn.[ean Society's] Trans.[actions], xxiii. 157: R.[oyal] S.[ociety's] C.[atalogue], iv. 495. [Commemorated in] BARCLAYA MOTLEYI, Hook. t.

The statement that he was murdered by Mohammedan settlers is derived from the *Transactions of the Linnean Society*, loc. cit., where Sir Joseph Hooker in dedicating to him the jungle water-lily, *Barclaya Motleyi*, states that the examination of it was almost the last botanical work that he did. The implication that the murder was done in 1855 arises from want of evidence as to the date. But the events which led up to his death are recorded in the Singapore Free Press for 1859: and as apparently there appears to be only one file of the paper existing, it seems desirable to recall them. The word "settlers" disappears from the story.

James Motley was a Civil Engineer, who about 1852 went to Labuan in connection with coal-mining there, and became later the Superintendent of the coal-mining operations of a private company upon a concession in the territory of the Sultan of Banjermassin. This concession was along the Sungai Banvu Iraug at two or three days journey to the south of Banjermassin town. There he was in 1859. In the very commencement of that year sinister whispers of sedition brewing in Banjermassin reached the Dutch Government in Batavia: but so badly was the Government served by their Resident at the Sultan's court that they were told in answer to their immediate enquiries that it was nothing. It was in fact a court-intrigue to replace the ruler by his brother, and, in doing so, to overthrow Dutch authority by which the reigning

Sultan was maintained. The plotters played upon religious fanaticism, producing for their purpose a man who claimed to have come from heaven, and instigated the Dyaks to rise. They rose on April 28th,§ and attacked the mines at Pengaron which is on the east of Banjermassin, about as remote from it as the Sungei Banyu Irang is to the south. Though they were beaten off, they succeeded in arresting the messenger sent to Banjermassin to report, and killed him.

Three days later § they attacked Motley's mines, killing Motley at a place called Bangkal,† and Motley's wife and three children at a place called Kalangan;‡ where also they murdered the rest of the company's staff, their wives and children, all except a few infants. They murdered also about the same date in the same region a Dutch political officer and several missionaries. They all but got possession of the country, so that the fighting extended to Banjermassin itself, and it was not for two years that there was quiet again.

§ Singapore Free Press of 2nd. June, 1859.

† Singapore Free Press of 30th. June, 1859.

Notes on Dipterocarps.

No. 3. The seedling of *Shorea robusta*, Roxb., and the conditions under which it grows into pure forests.

BY I. H. BURKILL.

In this *Journal*, 1917, pp. 163—167, outline figures of the seedlings of some Malayan Shoreas were given; and the remark was made that the Indian *Shorea robusta*, well known as *Sal*, differs from them in the elongation of the stalks of its cotyledons. It is now possible to illustrate the remark by an outline figure of the seedling of *Shorea robusta* at the same stage as the Malayan species; and if the reader, after glancing at it, will turn back to the pages named, he will see at once how wide is this difference.

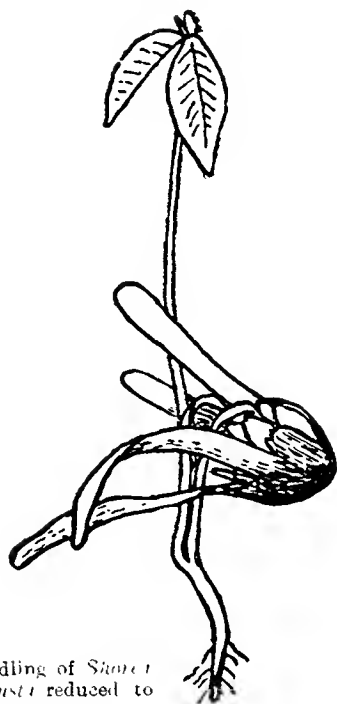
In my material of *S. robusta* the stalks of the cotyledons attained 6 cm. in length; whereas those of the Malayan species figured before never exceeded 1 cm.

I owe the material to the kindness of Mr. R. S. Hole of the Indian Forest Service, Botanist at the Imperial Forest Research Institute, Dehra Dun.

Shorea robusta is one of the most important of Indian Forest trees: for instance, Pearson estimated in 1913 that the annual production exceeded eight million cubic feet (Economic Value of *Shorea robusta*, *Indian Forest Memoirs*, ii, part 3, 1913, p. 70); and while the Government conserves large forests of it, there are also considerable areas privately owned and worked. The distribution of the Government forests may be gathered easily from Caecia's paper entitled "Development of *Sal*" in the *Indian Forest Records*, vol. 1, part 2, 1908, p. 85, to which a map is appended. The privately owned forests lie in the same regions, which may be summarised thus:—

(i) a belt, extending along the base of the Himalaya, and up its slopes to about 4000 feet (in favoured localities somewhat higher) between the Kangra valley on the west and the Darrang district in Assam on the east.

(ii) the country east of the Bengal plains comprised in the Garo, Khasi and Jaintea hills, and the hilly district of Nowgong to the north.



Seedling of *Shorea robusta* reduced to
23.

(iii) the hills south west of the Bengal plains, westward to Pachmarhi, and southward into the Circars, as far as Jeypur.

In a general way these three areas are together the rim of the cup into which the monsoon current from the Bay of Bengal pours its moist air from May to September, with precipitations from June. At the extreme western points the average annual rainfall is reduced to below 40 inches. In other places the precipitation is upward of five times as much. On the hills and also to some extent in the plains, Sal withstands frost. Everywhere it demands good drainage.

The Sal tree flowers in March or April when the dry season is on, changing its leaves rapidly just previously or at the same time; and thus in every year; but a good seed crop is only yielded about once in three years. McIntyre (*Notes on Sal in Bengal*, Forest Pamphlets Series, 1909, p. 2) attributes to unfavourable weather the failure to yield annually; but this is a point which demands investigation. The seeds are ripe in the commencement of the rains, and are ready for immediate growth; in fact they often germinate on the tree (vide Brandis, *Forest Flora of the North-west and Central India*, 1874, p. 27, and also earlier writers); if drought follows their fall to the ground, they are likely to die.

They are starchy (about 60 per cent of starch on dry weight); but they fail as a food on account of tannins present to the extent of 8 per cent. These tannins act on man as poisons causing indigestion, constipation and ultimately death (see Reinherz, in *The Agricultural Ledger*, 1904, No. 5, pp. 33—36). It is obvious that they serve to protect the seed, but not altogether;* for many animals feed on them†; and, as with all vegetation, there are specialised insect-enemies.‡

The seeds of the Malayan Shoreas seem very similar in being relatively rich in tannins: and to have similar enemies.

The parent Sal tree many attain 20—25 feet in girth, but it is recorded that it may be a seed-bearer with as little girth as $7\frac{1}{2}$ inches (Troup in *Forest Bulletins*, New Series, No. 8, 1912). Troup was unable to show any laws of variation relating to the viability of seed got from trees of different sizes, of different degrees of soundness, of different localities, or of seed ripened in the beginning, middle or end of the seed-time, but he suspected a possible law in regard to the last, the middle of the season being best. Haines (*A Forest Flora of Chota Nagpur*, 1910, p. 178), has said that the earliest are generally bad.

There is no albumen around the embryo plant in the seed, but all its store of food is in its gorged bilobed cotyledons. It has been shown for *S. leprosula* (this *Journal*, 1917, p. 161) how the lobes of the cotyledons, enwrapping in their growth the placenta and the sterile cells of the ovary, push themselves into the apex of the fruit. In *S. robusta* the two lobes of the inner cotyledon alone attain it, shutting out the outer, as suggested in the illustration above.

The seeds, upon falling to the ground, thrust the radicle to the soil chiefly by the growth of the stalks of the cotyledons, the cotyledons themselves remaining loosely apposed, and scarcely functioning as assimilatory organs. Herein is a great divergence from what is to be found in those Malayan Shoreas that are known to me, a divergence which carries *S. robusta* to a position in the order close to the genus *Dipterocarpus*; for the cotyledons in *Dipterocarpus* remain imprisoned within the wall of the fruit, do not assimilate, and as the young plant grows are depleted of their food through their stalks which elongate, although not exactly to plant the radicle as those of *S. robusta*, but accomodatingly to the elongation of the hypocotyl.

* Tannins are present also in the bark of the Sal tree to the extent of 8—10 per cent (vide Pearson, Economic value of *Shorea robusta*, in *Indian Forest Memoirs*, ii, part 3, 1913).

† In Mr. Hole's experiments porcupines were troublesome (*Indian Forest Records*, v, part 4, 1916, p. 52).

‡ E. B. Stebbing describes the Indian insect enemies of *Shorea robusta* in a paper entitled *some Assam Sal insect pests*, Forest Bulletin Series, 1907.

This relationship of *S. robusta* to the genus *Dipterocarpus* finds confirmation in the anatomy as determined by Heim. Heim. (*Recherches sur les Dipterocarpacees*, Paris, 1890, p. 40), having divided *Shorea* into nine sections, and having put *S. robusta* into the first of them, called *Eu-Shorea*, wrote of it, "This section seems to make connection with the genus *Dipterocarpus* especially by reason of the distribution of its vascular bundles in the leaf-stalk, and in the number of resin canals; but in the shape of the stamens it diverges more than do other sections such as *Antho-Shorea*."

Unfortunately of Heim's *Eu-Shoreas* there are many species yet to study.

S. robusta at its best, where the drainage is excellent and the soil is deep, makes pure forests, of a beautiful dark green, and often with the ground coated by seedlings struggling up under the parent trees. Hole (*Indian Forest Records*, v., part 4, p. 52) has found that the seedlings will grow healthily under an artificial shade which reduces the light to .015, demonstrating so how well the species is able to tolerate, when young, the deep shade those forests, wherein it asserts itself continuously against other trees. This power of making pure forests is possessed by some other *Dipterocarps*, *Dipterocarpus* itself possesses it, and *Dryobalanops Camphora*, and *Shorea assamica*, none in competition against another, but each in its own particular geographic region:—*S. robusta* round the rim of the Bengal plains, *S. assamica* in Upper Assam, *Dipterocarpus* chiefly through Burma, Siam and Indo-China, and *Dryobalanops* in Sumatra, Borneo and the Malay Peninsula.

Some observers have written of the success of *Shorea robusta* as connected with forest fires. Gamble pointed out that it drops its seeds after the season of fires is over, and shares the profit got thereby in its less pure forests with *Stereospermum chelonoides*—a rather constant companion which sheds its seeds at the same time. Brandis (*Forest Flora* XIII, p. 53) remarked that the reproduction of Sal may be materially increased by the circumstance that the seed falls after the fires have passed. Many foresters, the last Troup (*Indian Forester*, 1916, p. 57), have pointed out that if fire is withheld the coating of dead leaves on the forest floor prevents the sprouting seeds from sending their roots down, and betrays them by drying rapidly when a dry spell comes. Others have pointed to the way in which a coating of grasses and other herbs may hold the seed from off the ground by its wings, so that it germinates in the air, to be dried up soon: and that as these leaves and grasses are destroyed by the fires, a way is thereby prepared for the seed.

Haines (*Indian Forester*, 1917, p. 311) has stated that fires are advantageous in another direction, namely that they diminish the abundance in the forests of the fungi which attack Sal.

But if the fires be repeated too soon any occasional advantage is lost*. And after all what is the advantage where conditions are favourable to Sal, for there considerably over ninety-nine per cent of the seeds which fall must fail for want of room.

It cannot be that the liability of Sal or Dipterocarpus forests to fires assists at all in maintaining pure forest other than perhaps as Haines suggests in destroying fungi. So much is this recognised that every Indian forester of experience advocates fire protection, as a principle. But fire applied not more frequently than, say, triennially beyond the edge of pure forest may assist the Sal or Dipterocarpus in extending by clearing the way for the seed and damaging the competitors. Unfortunately forest fires where likely to occur, are annual. And under this view, the failure of the Malayan Shoreas to make pure forests is scarcely to be ascribed to their freedom from them.

It is on deep open soils that Sal makes the pure forests—soils such as happen to be peculiarly well developed by rapid rivers from out of the rocks of the Himalaya, soils where the water may sink in dry periods in such a way† as to injure many plants which compete elsewhere. Sal finds on these soils the combination of yet unanalysed conditions ideal to it; and obviously it has a peculiar physiological adaptation to their nature to which its success may be ascribed. This physiological adaptation it shares somewhat with *Shorea assamica*: for *Shorea assamica* makes its pure forests on just the same kinds of soil.

Sal seedlings have a wonderful power of replacing the primary stem if it be lost, even right from the axils of the cotyledons. So far I have seen nothing like it in the Malayan Shoreas. Not once only can the seedling make good the leader, but it may renew it again and again through some years. Hole has illustrated this process in three places (*Indian Forest Records*, v, part 4, 1916, plate 1; *Indian Forester*, 1916, plate 23, p. 336; and *Agricultural Journal of India*, Indian Science Congress Number, 1916, plate 1.)

This loss of the leader is usually caused by something which is not a forest fire, though forest fires may of course cause it; and in at least ninety per cent of cases it comes from some underground influence acting through the root. Hole finds that the mixing with the soil of leaves, especially of Sal leaves, increases it, and he suggests that a toxic body is produced in the process of their decomposition directly or indirectly. If this be so, then light forest fires by removing the leaves on the forest floor may do good.

For the destruction of the Sal forests at the foot of the Himalaya between the rivers Gandak and Teesta, by repeated firing, see my note in the *Journal of the Asiatic Society of Bengal*, 1916, p. 267.

† Cf. Milward's statement (*Indian Forester*, xxviii, 1903, p. 411) that under excellent Sal in O.D. the water may be 40 feet down.

This dying back of Sal seedlings is most intense in the rains: the seedling in appearance dies back exactly as it does also from drought, as if the plethora of water at the roots works in the same way as its want. But Sal seedlings can be grown in water cultures, and therefore contact with water itself has nothing to do with it. It would rather seem to be something shut out from or brought to the roots (Hole's toxic body for instance) by the water. Death can be caused in pots without the neighbourhood of other plants, and and therefore by no toxic excretion of another plant (Hole in *Indian Forester*, 1916, p. 337). The Malayan Shoreas too die in wet periods, as far as I have observed, but there is this difference that Sal dies back only, whereas they die out. Herein is a difference between the two, perhaps connected with the greater success of the Sal (within its area).—a difference which demands investigation.

For the purpose in hand, namely to form a sound classification of the order to which these trees belong, two facts may be useful. (i) that the Indian species *S. robusta* and *S. obtusa*, are more able to make pure forests than any of our many Malayan Shoreas, and (ii) that *S. robusta*, at any rate, is in its seedling more similar to the genus *Dipterocarpus* which also forms pure forests, than are the Malay Shoreas, *S. leprosula*, Miq., *S. rigida*, Brandis, *S. macroptera*, Dyer, *S. bracteolata*, Dyer, and *S. gibbosa*, Brandis. The pure forests are not the creation of man through firing: but the mixed forests may carry his impress.

A new *Dendrobium*, *D. gracilipes*, from the Rhio Archipelago.

BY I. H. BURKILL.

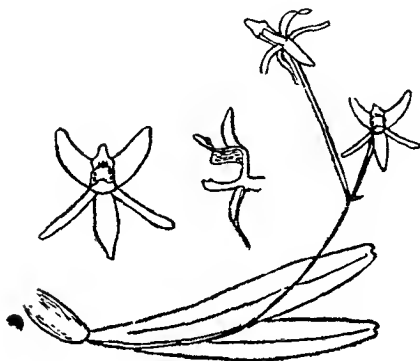


Figure of *Dendrobium gracilipes* reduced to $\frac{1}{2}$: the flower in section
and in face view natural size.

Dendrobium (Sarcopodium) gracilipes. *Rhizoma* longum, seu pennae corvinae crassum. *Pseudobulbi* juniores bracteis scariosis vaginati, deinde nudi, 4 cm. dispersi, oblique ovoidei, circa 3 cm. longi, politi, viridissimi, nitentes, diametro ad 1.4 mm., bifoliati. *Folia*, glabra, sessilia, lineari-elliptica, ad 16 cm. longa, ad 2.5 cm. lata, polita nitentia, saturate viridia, pagina inferiori pallidiora, apice bidentata dentibus rotundatis. *Pedicellus* glaber, capillaris inter folia natus, biflorus, viridis. *Ovarium* pallidum, longum. *Sepala* eburnea, lanceolata; dorsale cum ovario angulum rectum faciens; lateralia ad pedem gynostemii decurrentia mentum rectangulare 5 mm. longum formantia, leviter curvata: omnia 15 mm. longa, 5 mm. lata, acuta. *Petala* linearia, sepalis aequilonga, 1.5 mm. lata, eburnea, leviter curvata, acuta. *Labellum* trilobatum; lobi laterales velut parietes atri erecti, margine superiori admodum recti, intus purpureo-puncticulati, apice purpurei, etiamque in marginibus superioribus purpurei, in margine inferiori saturate crocei; lobus medius subdeltoideus ex basi lata apice subacuminatus, marginibus et apice eburneus, versus fauces croceus, tri-carinatus. *Columna* ex ovario prorsa, eburnea, equilateralis, ad basi infra rufo-brunnea.

RHIO. Colitur in Singapur a B. K. Saheli, floruit mense Octobri et mense Novembri.

This species is near *Dendrobium longipes*, Hook. f. and *D. macropodium*, Hook. f., the former especially. It is much more slender than either, and indeed is a really graceful little orchid. From *D. longipes* it differs also in its narrow petals and the straighter side to the lateral lobes of the labellum. These lateral lobes are folded upwards so as to make the walls of the rectangular tunnel into which insects are invited that they may fertilise the flowers. The mid lobe of the labellum is very much as in *D. longipes* (vide Hooker's *Icones plantarum*, plate 2617): its bright yellow centre set off by the purple at its back on the side lobes and the reddish brown in the back under the column. The rest of the flower is ivory white. The long slender ovaries are as in *D. longipes*, and as in *D. macropodium*.

On the whole the flower superficially suggests a *Cochloogyne*.

The Cannibal King in the "Kedah Annals."

By C. O. BLAGDEN.

The story of the cannibal king on pp. 74-77 of the "Hikayat Marong Mahawangsa" (*J. R. A. S., S. B., No. 72, May, 1916*), differs a good deal in setting and incident from the similar tale in Number 537 of Fausboll's series of the "Maha-Sutasoma-Jataka" (vol. V, p. 246 seq. of the translation by Francis in Cowell's edition); but these two tales have so many points of agreement that it is difficult to suppose they are unconnected. I shall mention a few of the chief differences, as they occur in the course of the narrative; but my main purpose will be to draw attention to points of resemblance.

The openings differ. In the Indian story the king of Benares develops cannibal propensities in accordance with Buddhist ideas of transmigration, because in a previous existence he has been a Yakkha or ogre; and he has occasion first to taste human flesh, because one day a dog steals his plate of meat and the king's cook (a man) dashes up instead a portion of flesh cut from a fresh corpse in the cemetery.

In the Malay story, the cannibal king of Kedah is the son of an ogress or *Girgasi*, and he first tastes human blood, when one day his cook, a woman, cutting her finger by accident lets the blood drip into a vegetable curry and there is no time to prepare another dish.

Incidentally one may surmise that the detail of the "fresh corpse" in the Indian version is an instance of the old Buddhist custom (similar to the Parsi habit) of exposing corpses to be eaten by birds of prey; and one may compare Groeneveldt's "Notes on the Malay Archipelago and Malacca," *s.c.* Tun-Sun, in "Essays Relating to Indo-China, Second Series," vol. I, p. 240, where however the dying are so exposed.

After the opening the two stories agree in many details. In both, the king takes great pleasure in his horrid meal, even before he is aware of its ingredients. In both, the cook is threatened with death in default of confession as to the *recipe*! In both, the cook confesses, and the king, so far from being shocked, orders more of the gruesome fare, battenning first on prisoners from the gaol and later kidnapping the bodies of innocent people to supply the royal table; until at last there is uproar in the realm.

In the Indian tale the cook is caught taking flesh from the body of a woman he has just killed; in the Malay, the king is attacked by a bravo and a great fight ensues. In both tales, the king's

ministers, moved by popular clamour, warn their master: and he rejecting the warning is expelled from his country, peaceably in the Indian version and taking his sword and cook with him, ignominiously in the Malay story after a desperate onslaught on the palace, whence he escapes by a private door.

In the Indian story, the king after a number of adventures in the jungle is converted from cannibalism by Sutasoma, an incarnation of the Buddha in a previous existence—for the "Jatakas" purport to be stories of the Buddha's earlier births: he is brought to Benares a changed man, and is welcomed by the son who reigns in his stead. In the Kedah version, the king mates with a girl of good family in a remote part of the country and, after once more escaping his enraged pursuers, is lost sight of: but the son of that union is restored to reign in the capital by virtue of the magical sagacity of an elephant in detecting the royal infant and by virtue of the king of Siam's warrant.

When it is remembered that in Buddhist countries the "Jatakas" are known not only to the literate but in popular folk-lore, it becomes reasonable to infer that the Kedah tale has been borrowed from a Siamese source. Man-eating ogres are usual enough; but in the two tales considered, coincidence of small detail seems to demand explanation more particular than the common uniformity of the human mind in the invention of folk-tales.

For a parallel in Sinhalese legendary history those interested may consult p. 234 of my "Catalogue of European Manuscripts in the India Office Library, vol. I. part I."

The Hadramaut Saiyids of Perak and Siak.

BY R. O. WINSTEDT.

On pp. 2-5 of *Law Part II, The Ninety-Nine Laws of Perak*, in *Papers on Malay Subjects*, published by the F. M. S. Govt., Mr. R. J. Wilkinson pointed out the great influence a certain Sayid family exercised on the history of Perak in the XVIIIth century. The family acquired the highest state offices, those of Orang Kaya Bésar and of Mantéri, and one of its members acted even as Bëndahara. Scions of this Sayid house were sought for eagerly in marriage and married into the families of all the greater Perak chiefs. One married the sister of Sultan Iskandar,—Marhum Kahar (whose reign is described in the *Misa' Melayu*) and was the father of a Perak Sultan. Another married a daughter of the raja of Siak and from their union were descended the rulers of Siak. Several were accounted saints.

How came this family to win such prestige and power?

Their genealogical tree copied by a former *mufti* of Perak, Raja Haji Yahya who in his youth gave Sir William Maxwell some Perak royal genealogies (*J. R. A. S., S. B. XIV*, p. 305) explains the matter. They were of the great house of Ahmad bin Esa al-Mohajir, the founder of the Sayid house of Hadramaut, which considers its nobility better established than that of all the other descendants of the Prophet's daughter, and refuses the hands of its daughters, even its half-caste daughters to Sherifs and Sayids come from other places. Van den Berg's "Hadramaut and the Arab colonies in the Indian Archipelago" gives the following particulars of this family: I quote from Sealy's translation (Bombay, 1887).

"The founder of the Sayids of Hadramaut is a certain Ahmad bin Isa, surnamed al-Mohajir who, according to tradition, established himself in the country about ten centuries ago. He was a native of Bassora. His genealogy is as follows: bin Esa bin Muhammad an-Nakib bin Ali al-Oraïdthi bin Ja'far as-Sadik bin Muhammad al-Bakir bin Ali Zainu'l-abidin bin al-Husain. To distinguish themselves from other Sayids those of Hadramaut call themselves *al-Alawiyin* descendants of 'Alawi, grandson of Ahmad bin Esa. Seven generations after Ahmad bin Esa the genealogical tree of the Sayids branches off with the two sons of Muhammad surnamed Sahib a'r-Robat. After this division, we see the genealogical tree of the Sayid divide itself more and more into separate families. I will give the names of the families so far as they exist in our days and their descent is generally acknowledged authentic:—

Al-a's-Sakkaf	Al-al-Haddad
— Akil	— ba-Fakih
— al-'Aldarus	— ba-Faraj
— Mo-shayyakh	— ba-Surra
— Taha	— al-Hochah
— a's-Safi	— Achul
— ba-Umar	— Jonand
— Munawwar	— a'sh-Shubh
— Shihabu'd-din	— Burud
— al-Hadi	— al-Monathir
— al-Mashhur	— Hamud
— a'z-Zahir	— Mutadhar
— a's-Sulaibiyah	— Mudhar
— bin-Kitban	— Marzak
— al-Musawa	— Mudhiij
— al-Baiti	— abu-Noman
— Ismail	— Fadlak
— Maknun	— Khurid
— bin Barahim	— ba-Baraik
— ba-Sinmailih	— Khinainan
— Tawil	— ba-Husam
— Akil bin Sallah	— ba-Ah
— al-Attas	— al-Hut
— a'sh-Shaukh Babakr	— al-Ghaidtha
— al Haddar	— al-Hamil
— bu-Fotaim	— al-Bar
— Maula-a'd-Dawla	— al-Kaf
— Mukailbil	— ba-Rakba
— Maula Khlih	— al-Jifri
— bin Sahl	— al-Budh
— bin Yahya	— bil-Fakih
— ba-Abud	— al-Kadri
— al-Hindwan	— Siri
— al-Muhajjab	— ba Harun
— Abdu'l-Malik	— al-Habshi
— Hashim	— a'sh-Shatiri
— Simait	— a'sh-Shanbal
— Nidhir	— ba'sh-Shaban
— Tahir	— Jamal-al-lail
— Husain al-Kara	— al-Mihdthar

Among these families there are some which at this day no longer exist in Hadthramut but that does not mean they are extinct. Thus the family of Abdu'l-malik still exists in British India under the name of Al Athamat Khan. In the same way that of Ba'sh-Shaban exists in Java and that of al-Kadri at Pontianak."

Below I give the leading names in the Perak genealogical tree.

After the name of Sayid Ahmad bin Esa, the Malay genealogist has noted how he was a native of Bassorah.

The Perak family calls itself *bangsa Jamal-al-ail*; after the father of Sayid Husain al-Faradz, it is said. Sayid Husain al-Faradz bin Jamal-al-ail is reputed to have been the religious teacher of the first Sultan of Perak. (C Notes and Queries, R. A. S., S. B., No. 3, (1886), p. 70). He is recorded as having had a brother Sayid Yusuf and a sister Siti Këpayan, but that is all we hear of them. Judging by the genealogues, he must have flourished in the first half of the XVIIIth century.

Siti	Fatimah
Saidina	Husain
Saidina	Zamul-abidin
Saidina	Musa al-Kathim
Saidina	Ali a'z-Zahir
Saidina	Muhammad Bakir
Saidina	Jaffar a's-Sadik
Saidina	Ali a'z-Zahir
Saidina	Muhammad a'n-Nakib
Saidina	Esa
Saidina	Ahmad al-Mohajir
Saidina	Muhammad
Saidina	Alwi
Saidina	Ali Khali-kasam ba' Alwi
Saidina	Muhammad Sahib Mirbat
Saidina	Muhammad al-Fakih ¹
Saidina	Maula'd-dawilah Muhammad
Saidina	Abdu'r-rahman Sakat ²
Saidina	Abdu'llah Jamal-al-ail
Saidina	Alwi

Saidina Abdullah

Sa dīna Maulana
a's-sharīf Jamal-al-ail al-Jafī

Saidina Sharīf
Hasan al-Faradz

(He was the first to come to Perak.)

Of the above,¹ Saidina Muhammad al-Fakh had another son Alwi, whose descendants went to Tēringganu and one of them Sayid Ahmad returned to Perak and married Raja Hitam daughter of Sultan Ma'ūd-dīn Raja Sharīf Bisma of Perak, his descendants being the rajas and sayids of Chenderiang in Batang Padang, Perak. The pedigree of this branch is recorded: Sayid (or Raja) Ahmad bin Muhammad bin Yassin bin Akil bin Ahmad bin Yahya bin Hasan bin Ali bin Alwi bin Saidina Muhammad al-Fakh.

² Saidina Abdu'r-rahman had a number of children: Jamal-al-ail, al-Akil, al-Aldarus, Al-Abubakar, Salim, al-Hadr, Yahya, al-Mathar. Al-Aldarus begot a son Sayid Hasan, who went to Kedah and in his turn begot Sayid Husain of Kuala Muda.

The main Perak branch then runs as follows:—

Sayid Husain al-Faradz.

Sayid Hasan, ? Raja S'ari.

Sayid Abubakar.

Sayid Mustafa.

Sayid Abdu'l-majid, ? Mant'eri.

Sayid Jalalu'd-din,
To Tambak of Pulau Pisang.

Sayid Abubakar,
Mant'eri, Bendahara.
(floruit 1765)

Sayid Shamsu'd-din
Mant'eri, Chégar Galah
married

(a) To Puan Put'eri Bulan
d. of Orang Kaya Bésar
Kuala Kénas¹

To Engku Pandak
Ahmad, Kaya,²
m. Teh Kewa bti.
Sri Adika Raja
To Tésu

Sayid Mahmud,³
Orang Kaya Bésar,
created by
Sultan Ismail.

Sayid Usman-

Sayid Musa,
Pénghulu, Chégar Galah.

Siti Tok
Meriam,
Kéramat.

Sayid Ajmadin.

(b) To Puan Tunjong
bti. Sri Adika Raja
To Bérclak.

Sayid Alang
Muhammad
Kechil,
To Jawang.

S. Méntaha Siti Hawa.

Sayid Yunus,
Pénghulu Teja

Sayid Jaffar,⁴
Orang Kaya Bésar.

Sayid Hasan
m. Raja Shah Alam,
sister of Sultan
Iskandar. Marhum
Kabar

Sultan Ala'u'd-din
Raja Sharif Bisnu,
m. Raja Sudea Kasul,
binti Sultan Iskandar
Marhum Kahar.

Raja Hitam,
m. Sayid Ahmad
of Trengganu.

The Chéndriang
family of Sayids
and Rajas.

Suiyid Husam
Mant'eri di-Bota

Young di-Pértuan Besar
Tengku Sayid Ali,
al-Marhum Kota Tinggi, Sink
(reigned 1791-1811; died 1821)

Raja Alang Radin,
m. Raja Chik.

Raja Pémpuan
Nggah Aminah, Shah Alam,
m. Sultan Abdu'llah Muhammad Shah.

Sultan Yusof of Perak.

Sayid Zainal.

Siti Hitam,
m. Sayid Ibrahim
Panjung Ijidong
of Sak.

Sayid Usman,
m. daughter of
Marhum Bukit, Sak.

Young di-Pértuan Besar
Tengku Sayid Ali,
al-Marhum Kota Tinggi, Sink
(reigned 1791-1811; died 1821)

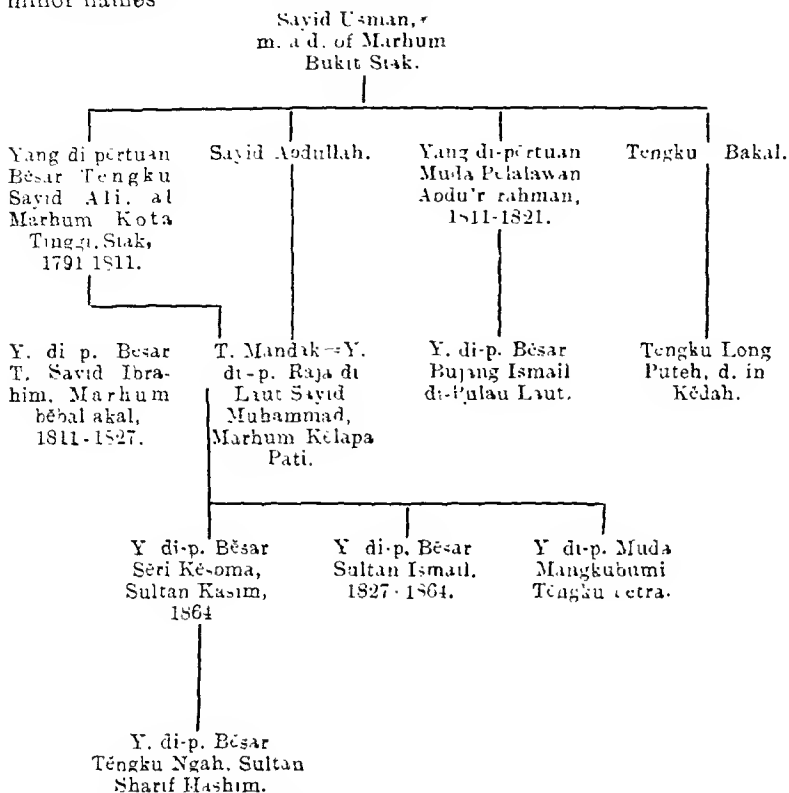
Raja Alang Radin,
m. Raja Chik.

Raja Pémpuan
Nggah Aminah, Shah Alam,
m. Sultan Abdu'llah Muhammad Shah.

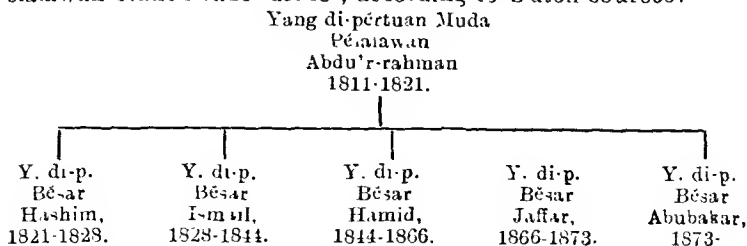
Sultan Yusof of Perak.

1. There is doubt as to the name of the Orang Kaya Bésar, Kuala Kénas. The genealogies give it variously as Méntaha, Mustafa or Mutabar. Probably "Kaya" = "Orang Kaya Bésar."
2. *Vide* J.R.A.S., S.B. IX, pp. 32 and 49.
3. *Vide* Law II, p. 2 (P.M.S.).
4. *Vide* Law II, p. 2 (P.M.S.).

The Siak family is given by our genealogist as follows: omitting minor names:—



We can add to this from Dutch sources, whence also I have taken the above dates. The Siak family styled their rulers Sultans. Sayid Usman was of the family bin Khibab. The Pelalawan branch runs further, according to Dutch sources:—



This last looks a very doubtful genealogy.

It was from the Siak royal Sayid family that Sultan Ismail of Perak war notoriety was descended. His father Raja Sayid Hitam was of this Siak family and was given in marriage by Sultan Abdullah Muadzam Shah (*marhum khalilu'llah*) of Perak one Raja Mandak, daughter of Marhum Bon su, his relative.

Some Perak Pedigrees.

BY R. O. WINSTEDT.

These pedigrees are interesting because comparison of sufficient genealogies of the royal and noble families of a country enables one to fix approximately the main dates of its history; and this is necessary in dealing with Malay history, whose records as a rule entirely lack chronological *data*.

The genealogies following are copied from MS. by that enthusiastic genealogist, Raja Haji Yahya, late *mufli* of Perak.

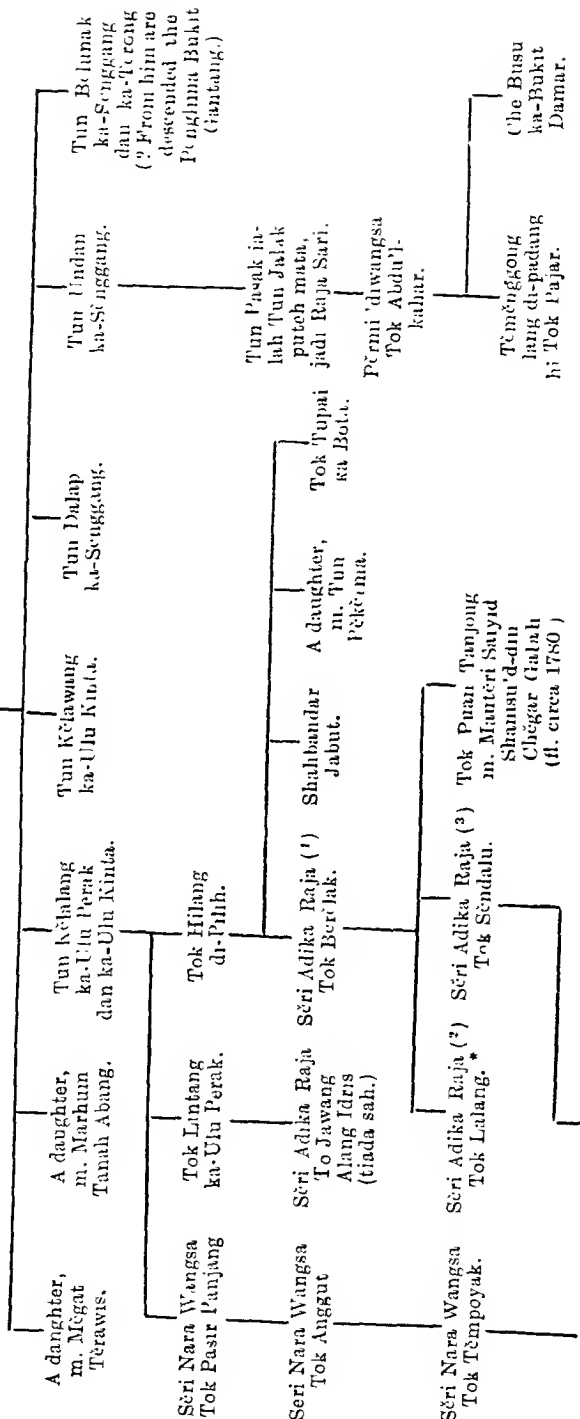
Tun (or Tan) Saban from whom these great house of the Sri Adika Raja (Wilkinson's "History I," pp. 80-81, in "Papers on Malay Subjects") and the lesser house of the Sri Amar 'diraja (*id.* p. 86) are descended, is the earliest name in the history of Perak (*id.* pp. 71-73, J. R. A. S., S. B., and Winstedt's "Malay Literature, II," pp. 40-42 or J. R. A. S., Vol. XIII, Part IV, pp. 501-507); from comparative study of the Perak genealogies one might doubt if he flourished earlier than the end of the seventeenth century, but the more reliable genealogy of the Perak Savids would lead one to ascribe the founding of the Perak dynasty to the beginning of that century.

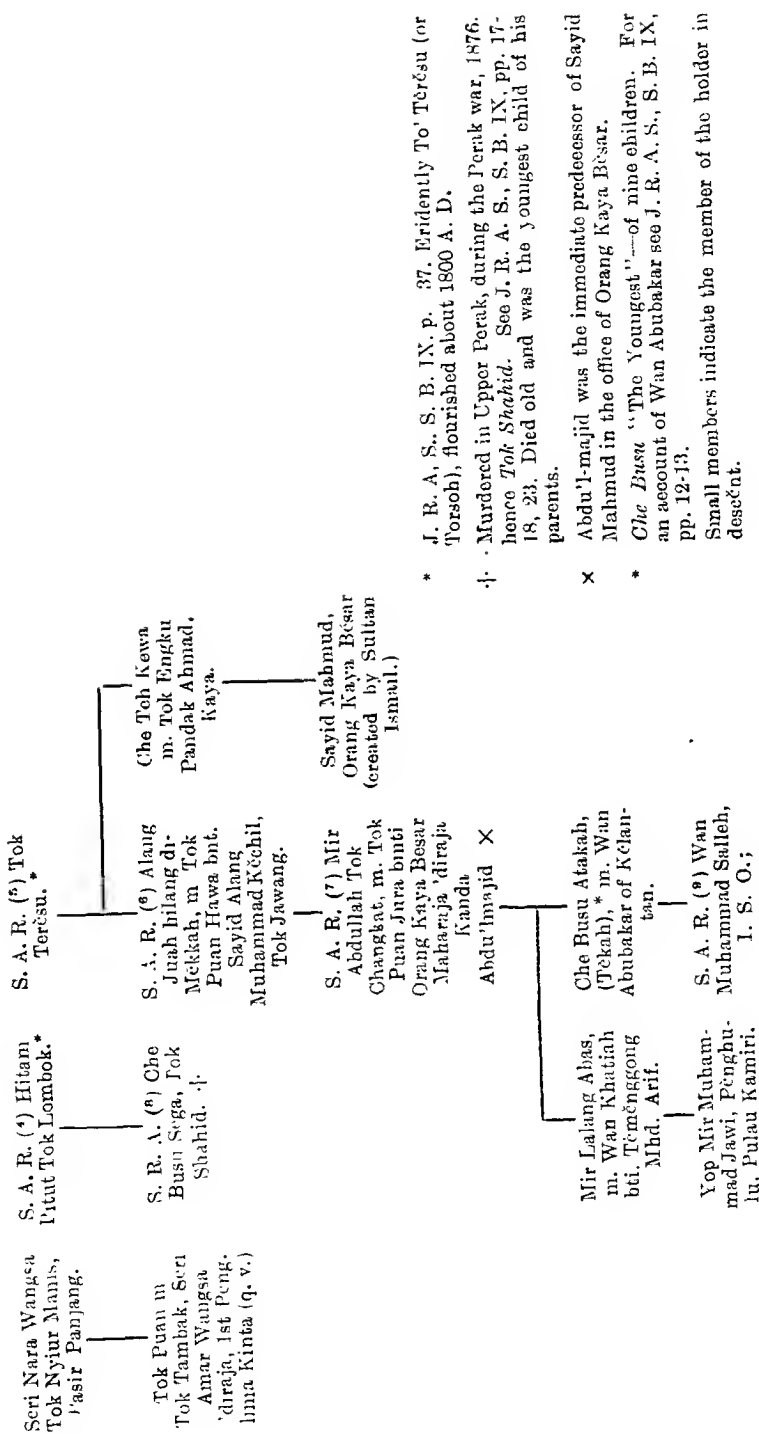
The Family of the Seri Adika Raja.

56

Abik Wamik
Tok Perak.

Tun Sab Bahik
Hilang di-Bukit Merah.





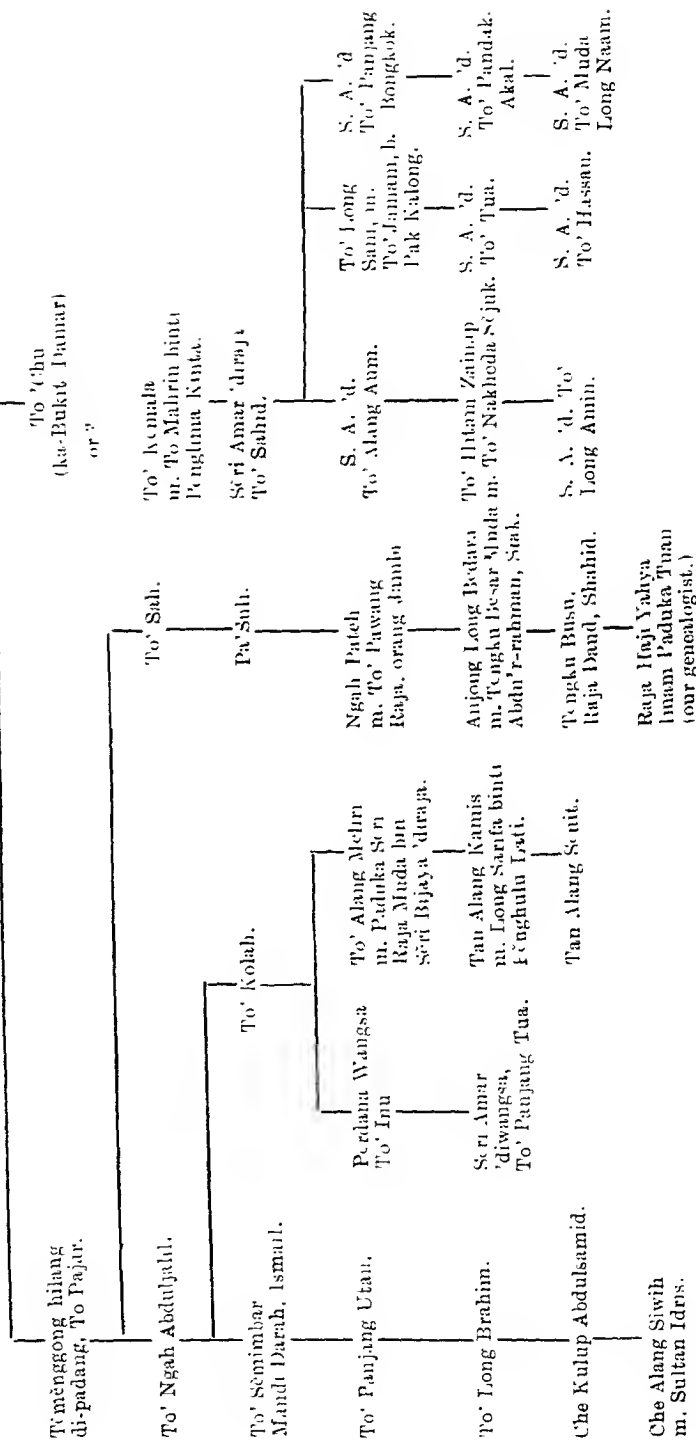
The Family of the Seri Amar 'diraja

Tun Saban Balik.

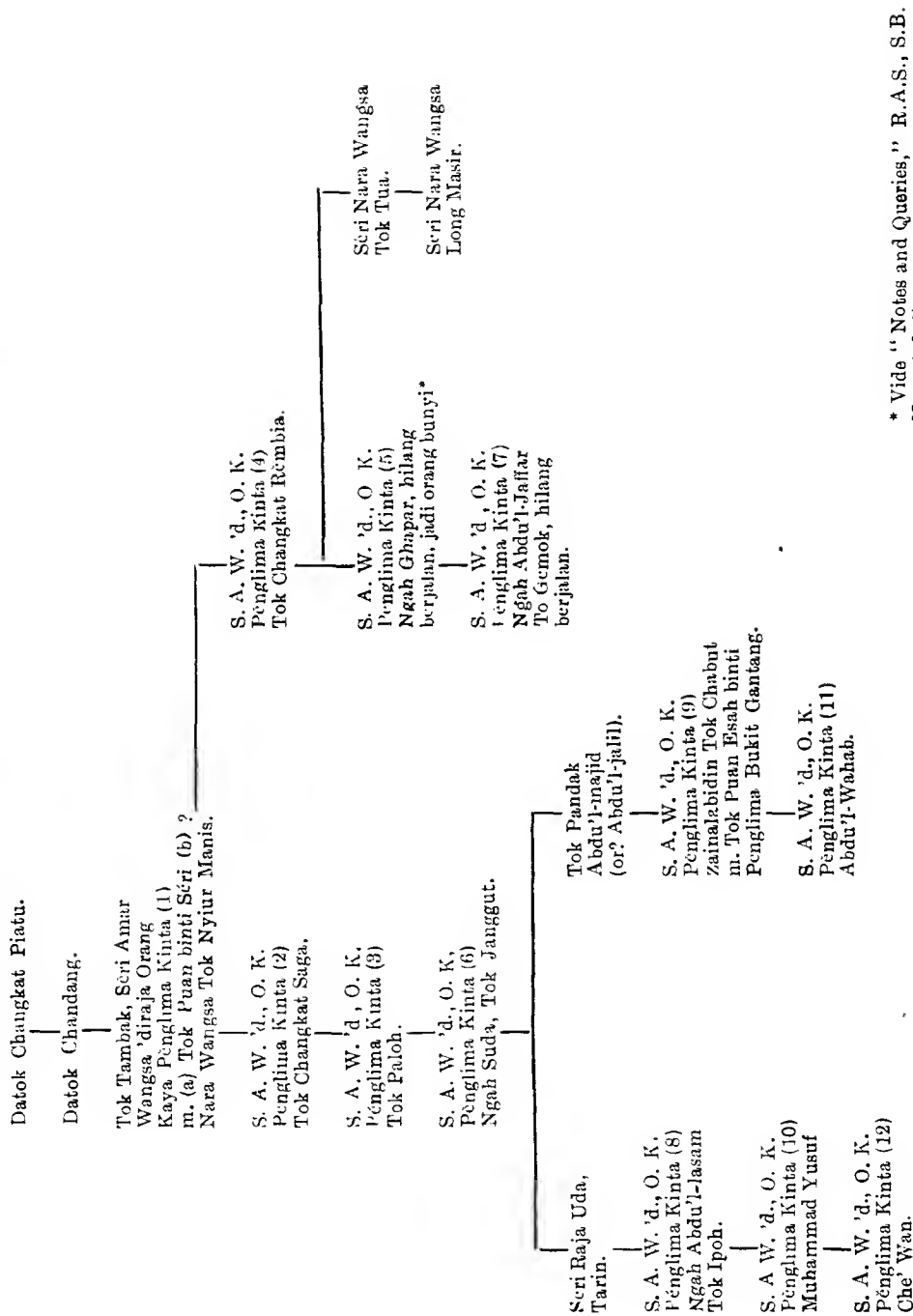
Tun Undan.

Tun Pasak Jalak,
putih mata
(Jah Raja sa-hari.)

Dato Abdu'lkabar,
Permi 'diwangsa.



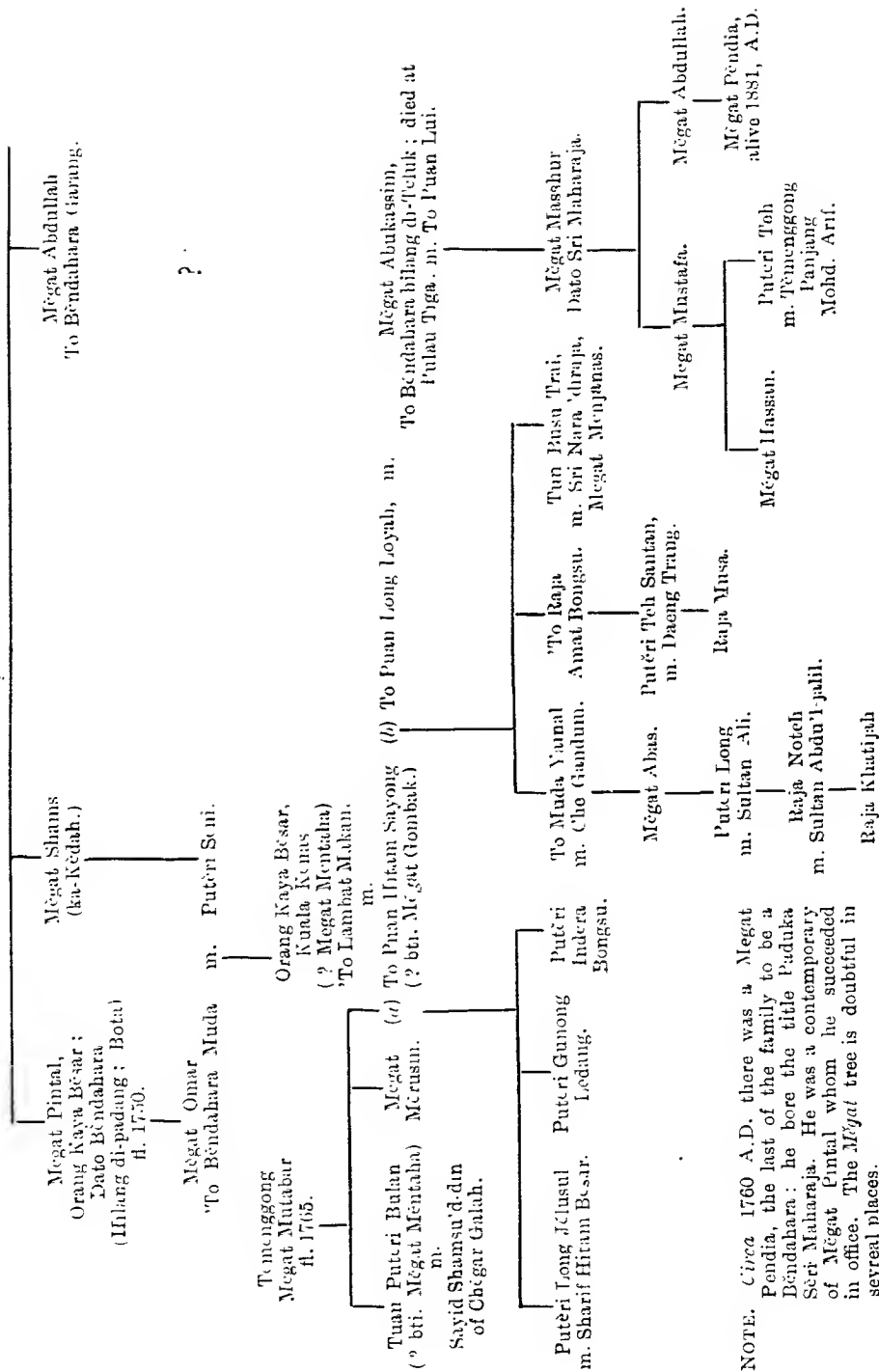
The Family of the Penglima Kinta.



* Vide "Notes and Queries," R.A.S., S.B.
No. 3 (1886), p. 81.

Family of the Megats who held the offices of Bendahara till 1770 A.D.

Megat Terawis.
(fl. ? 1650 A.D.)

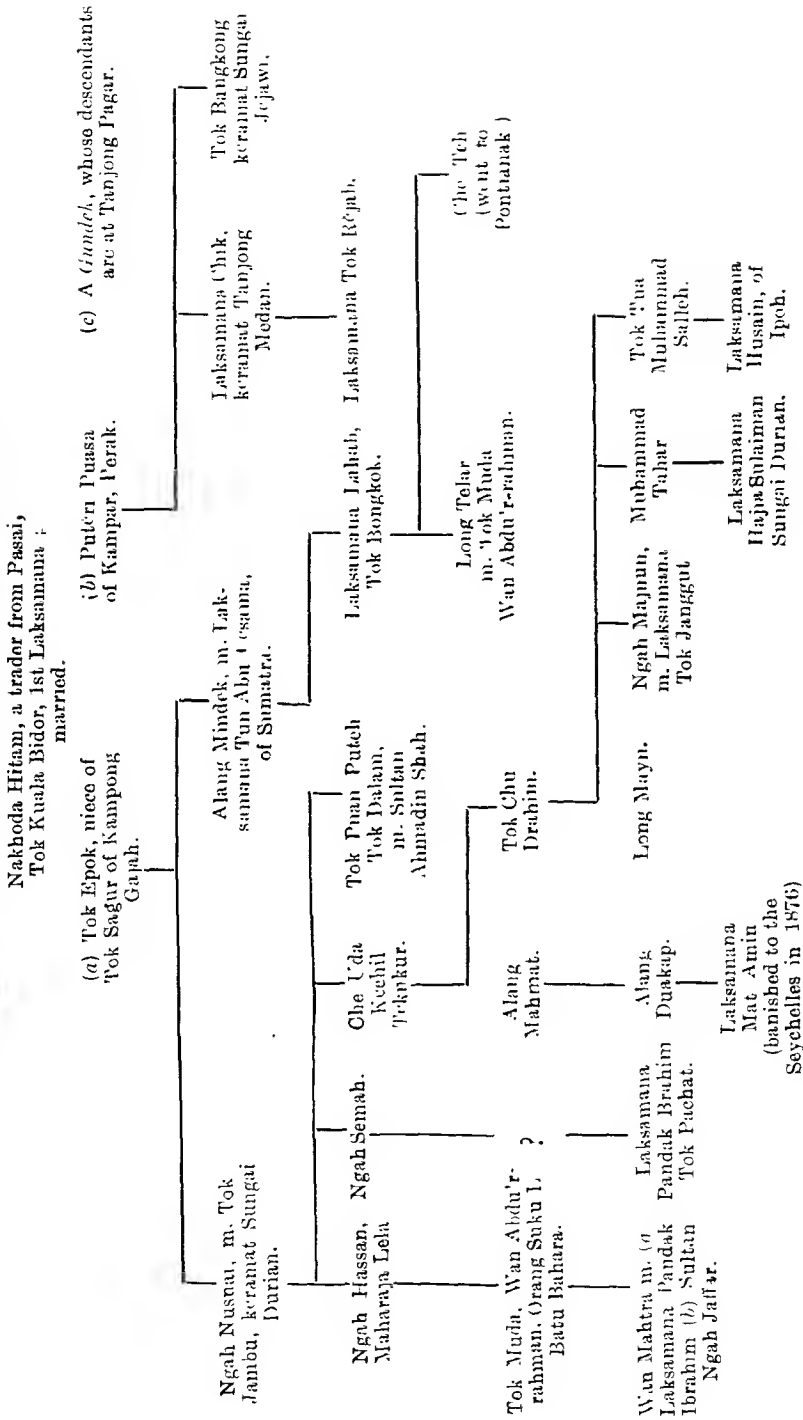


NOTE. Circa 1760 A.D. there was a Megat Pendia, the last of the family to be a Bendahara: he bore the title Puduk Sert Maharaja. He was a contemporary of Megat Pintal whom he succeeded in office. The *Megat* tree is doubtful in several places.

NOTE.

The Sri Nara 'diraja family claim two holders of the office of Orang Kaya Bĕsar, Perak before the Orang Kaya Bĕsar, Kuala Kĕnas its third holder. The first was a son of Sri Nara 'diraja Samah and a grandson of S. N. 'd. Pandak: the second was Orang Kaya Bĕsar Pendek, son of a Tan Dewi.

The Family of the Laksamana.



* Vide Notes and Queries, R.A.S., S.B. No. 2 (1885), p. 47 :
Also *Misa M'layu*. Floruit, 1765 A.D.

New and Rare Malayan Plants

Series X.

By H. N. RIDLEY, C.M.G., F.R.S.

During the continuation of my studies of the Malay Peninsula flora I continue to find a good many species which have not been described, or have been for various reasons confused with others. In this series which is a continuation of the preceding ones, it is noteworthy that there are no less than four species quite common in the country but which are nameless, these are *Memecylon Wallichii*, n. sp. confused with *M. amplexicaule*, Roxb. *Morinda elliptica*, n. sp. one of our very commonest trees, confused with *M. citrifolia*, L.; *Fagraea gigantea*, n. sp. confused with *F. fragrans*, Roxb. and *F. speciosa*, Bl. and *Allomorphia malaccensis*, n. sp. confused with *A. erigua*, Bl. In some cases the cause of the error was due to the badness of specimens sent home; often the commoner the species the more seldom is it collected, as the botanist is apt to think it has been frequently sent home and neglects to collect it. In other cases the mistake is due to Botanists not having sufficiently carefully compared the type specimens and the description. Thus both in the case of the *Memecylon* and *Allomorphia*, the types or co-types are preserved and readily accessible and in good condition yet early botanists have confused with the original species totally different plants, and have been followed by later botanists to the present day.

Other new species are due to more recent discoveries in our flora.

STERCULIACEAE.

***Sterculia brachycarpa*, n. sp.**

A tree 50-60 feet tall, stem 8-12 in. through. Leaves chartaceous, dull, deep green, elliptic or obovate-elliptic abruptly acuminate, base blunt or shortly narrowed, glabrous above except the red pubescent midrib, beneath midrib and nerves 9 pairs and reticulations distinctly elevate and covered with stellate hairs, red on the midrib, 6-11 in. long and 3.5-5.5 in. wide, petiole 1.5 to 2 in. long, hairy. Racemes 3-3.5 in. long, slender dense, dark red velvety. Pedicels 25 in. long, red, velvety. Sepals oblong lanceolate narrowed a little to tips, densely hairy 2 in. long. Andraecium half as long glabrous, anthers 7. Female flowers not seen. Carpels 3-4 ovate shortly pointed 1.5-2 in. long and as wide, densely velvety red. Seed 2 to a carpel, oblong .75 in. long, black.

SELANGOR, Sempang mines. (Ridley 15635). PERAK, Batang Padang district 300 to 500 ft. (Kunssler 7972).

This has been confused with *S. rubiginosa*, Vent., but is very distinct in its much larger leaves, much longer petioles, broader sepals, and short, broad 2 seeded carpels. It is also much less hairy and the pedicels much shorter and the flowers are in a simple raceme.

MYRTACEAE.

Eugenia formosa, Wallich. In the Materials for a Flora of the Malay Peninsula, King gives this species as occurring in Perak, the only specimens however, so labelled by him that I have seen are certainly the much smaller plant, *E. pseudo-formosa*.

E. formosa, Wallich, is a big tree with axillary red flowers borne below the leaves on the branches while *pseudo-formosa* is a shrub or at most a small straggling tree with white terminal flowers, the venation of the leaves quite different and the thick white corky petiole is very characteristic. The very narrow-leaved form which grows in Penang, by Richmond pool is the *Jambosa lanceolata* of Miquel, it is also my *E. nemoricola* but is I think now only a form of *pseudo-formosa*.

An *Eugenia* I collected in Selangor at Klang (No. 10200) more nearly resembles Wallich's *formosa* than anything else I have seen from the Malay Peninsula, but as it differs from the type in many respects I prefer to leave it doubtful until further specimens of the plant should be obtained.

Eugenia limnoea, n. sp.

Tree with red flaky bark. Leaves elliptic coriaceous, base very shortly narrowed, tip long, acuminate, blunt, nerves very fine and numerous distinctly raised beneath marching close to the edge, 5.5 in. long, 2 in. wide, petiole .3-.4 in. long. Panicle terminal 2 in. long, 2.5 in. wide, dense, many flowered on a peduncle 1.5 in. long. Calyx campanulate with a slender pseudo-stalk .2 in. long and as wide; lobes short rounded. Petals free, orbicular glandular .4 in. long. Stamens .3 in. long.

Open low lying, damp country. PROVINCE, WELLESLEY, Nibong Tebal (Ridley 12783) Krian (Ridley 9378). PERAK (*Scortechini*). PENANG, Batu Ferringhi (Ridley 12576).

This plant has been identified as *E. densiflora*, Duthie by King and what appears to be identical is *E. oblongifolia* var. *robusta*, King, collected in Perak by Scortechini.

It has nothing to do with *E. oblongifolia*, Duthie. *E. limnoea* is allied to *E. densiflora* and appears to replace it in the northern part of the Peninsula. It differs in the flowers being only half as long, and the nerves, nervules and reticulations being very fine and close. The intra-marginal nerve lies close to the edge of the leaf, instead of a long way from it.

with a second intramarginal between it and the leaf-edge as in *E. densiflora* the base of the leaf is broader and more rounded and the leaves are generally more ovate. As in *E. densiflora* the midrib is deeply sunk above, prominent beneath, and the whole surface of the leaf beneath is pustular.

***Eugenia pauper*, n. sp.**

A small tree, branches rather slender, bark light reddish. Leaves thinly coriaceous, punctate above, pustulate beneath, elliptic, abruptly cuspidate, base emarginate, nerves 10 to 12 pairs depressed above, elevate beneath marching to form an intramarginal nerve .1 in. from the edge, midrib channelled above, elevate beneath 5.5 to 6 in. long 2.5 in. wide, petiole .4 in. long, slightly thickened, black. Cymes axillary solitary in each axil .5 to .75 in. long with 2 or 3 flowers on the ends of the 2 or 3 branches. Bracts minute at the base of the flowers. Calyx cup-shaped, truncate, suddenly narrowed to a slender pseudo-stalk .1 in. long, pustular. Petals calyptrate.

JOHOR, in Gunung Pulai and Gunung Pantai (*Ridley* 12175 and 4200).

This is nearest to *E. oblata*, Duthie which it exactly resembles in the inflorescence, but the venation and shape of leaves is quite different.

***Eugenia cyrtophylloides*, n. sp.**

A tree with pale reddish bark. Leaves stiffly coriaceous, lanceolate, acute or cuspidate, base narrowed, decurrent on the petiole, black-dotted beneath, nerves very numerous, fine, visible above, very inconspicuous beneath; midrib strongly elevate, 3.5-4 in. long 1-1.5 in. wide, petiole .2 in. Panicle terminal 2 to 3 in. long, peduncle 1-2 in. long, branches 1 in. long terete, thick branchlets, 3 terminal on the branches, ending in 3 sessile flowers. Bracts caducous. Calyx .1 in. long gradually narrowed to a broad base, the lower part cylindric; lobes ovate, short. Corolla calyptrate. Stamens very short and few.

PAHANG, Wray's Camp, Gunung Tahan (*Ridley* 16214).

This belongs to the group of *E. punctulata*, with an urn-shaped calyx and calyptrate corolla and few stamens.

***Eugenia Klossii*, n. sp.**

A tree. Branchlets terete, black. Leaves in distant pairs, elliptic, acuminate, acute, base emarginate, thinly coriaceous, nerves about 20 pairs, elevate beneath, secondary nerves nearly as conspicuous, inarching .1 from the edge, reticulations wide conspicuous beneath, all inconspicuous above 5.5 in. long 2.25 in. 2.5 in. wide, petiole .2 in. long. Panicles 1-2 terminal 3 in. long or less, branches few, short with 1 to 3 terminal

flowers. Calyx broad, campanulate .2 in. across, truncate edge recurved, base abruptly narrowed to a slender pseudo-stalk .3 in. long. Petals calyprate. Stamens .4 in. long. Style .5 in. long.

SILANGOR, Rantau Panjang, July, 1911 (C. B. Kloss).

This is perhaps most nearly allied to *E. inophylla*, Roxb. but the nerves of the leaves are fewer and the panicle shorter, laxer and fewer flowered.

***Eugenia cordifoliata*, n. sp.**

Branches terete, pale coloured. Leaves elliptic with a short, blunt point, base narrowed, blunt, slightly cordate, membranous, drying blackish above, paler beneath, nerves about 18 pairs nearly invisible above, slightly elevate beneath in-arching .1 in. from the edge, 4 in. long 1.5 in. wide, petiole short, thick .1 in. long. Panicle terminal lax, 6 in. long, peduncle 2 in. long, branches angled, the lowest 3 in. long, branchlets crowded at the tip with pear-shaped buds narrowed to a slender pseudo-stalk. Calyx lobes ovate.

PERAK: without locality (*Scortechini*).

This is one of the two quite distinct plants quoted and labelled by King as representing his *Eugenia Swettenhamiana*. The other species which as represented in Herb. Kew. (all I have seen) collected in Larut by Kunstler, No. 7590, is very poor specimen in bad condition, and does not appear to be an *Eugenia* at all. The description of *E. Swettenhamiana* however, applies better to this specimen than to Scortechini's plant which is only in young bud. This latter plant is very distinct from any species I have seen in the rounded, cordate almost peltate leaf-base. It may perhaps be allied to *E. densiflora* but more developed specimens are required before deciding on its affinities.

MELASTOMACEAE.

***Melastoma scabrum*, n. sp.**

Shrub about 5 ft. tall, branchlets sparingly covered with small ovate lanceolate acuminate scales, very varied in size from minute irregular ones to lanceolate subulate ones, very short and appressed, on the leaves almost reduced to slight roughness, rather longer on the petiole. Leaves narrow, lanceolate, subacute, base rounded or shortly cuneate, above scabrid with short thornlike processes, nerves 5 with larger scales, 4-4.75 in. long, 1.25 to 1.50 in. wide; petiole .6 in. long. Flowers as big as those of *M. decemfidum*, pedicels .4 in. long. Calyx .4 in. long, campanulate, sparsely covered with lanceolate, acuminate scales, longest at the top, lobes linear acuminate with scales, long linear subulate outside.

Petals glabrous 1.5 in. long, pale rose pink. Stamens half the length of the petals, unequal, long ones 1.2 in. long. Style rather stout 1 in. long, ovary with long bristle-like hairs on the top.

KEDAH. Lankawi at Burau near Telayah Tujoh, April (*Ridley* 15813).

Osbeckia perakensis, n. sp.

Shrub about 8 feet tall much branched, twigs angled, young parts, petioles, leaves above and the nerves beneath covered with stiff bristly hairs. Leaves elliptic to ovate blunt base, round nerves 5 elevate beneath 1.25 in. long, .75 in. wide, petiole .15 in. long. Flowers 3 to 5 in a terminal head sessile in the terminal pair of leaves, in fruit a short pedicel .1 in. long is developed. Calyx .4 in. long, ovoid eventually semi-oblong, entirely covered with short, stiff bristles and star-shaped whorls of bristles on a distinct pedicel, lobes lanceolate, acuminate, fringed and keeled with simple bristles about 2 in. long. Petals obovate 1 in. long, deep pink-rose. Stamens 10, filaments slender, anthers .3 in. long, shortly acuminate. Style long and stout. Capsule semi-oblong .4 in. long .3 in. through, densely covered with stellate-hairy processes.

PERAK. Taiping Hills on Gnnong Hijau at 5,500 ft., first obtained by *Mrs. Bland*, in 1905, later by *J. W. Anderson*.

Perhaps nearest to *O. burifolia*, Thw. of Ceylon.

OXYSPOREAE.

The sorting out of the species of Oxysporeae of the Malay Peninsula into genera, is, it proves, a somewhat difficult task. I attempted it in vol. 57 of the Journal of the Straits Branch of the Royal Asiatic Society, but in the further light of later discoveries and investigations I find a modification is necessary. The following are the genera as I now propose them:—

Oxyspora, Woody, often tall shrubs with large stiff leaves and big terminal panicles of fairly large flowers. The stamens in the original species of De Candolle are 8 in number but of two forms four long and purple and four alternating shorter and yellow. In the Malay Peninsula we have only one species which exactly agrees with this viz. *O. stellulata*, King, a beautiful tree-like shrub with great panicles of light rose pink flowers. The other species which have the same habit and general structure have all the 8 stamens yellow and the two series almost or quite as long and similar. The capsule in the type species and in some others is long and funnel-shaped, but in *O. microcarpa* it is subglobose and small, and in *O. collina* short and cup-shaped. The following are our species:—

- Oxyspora stellaulia*, King
 „ *acutangula*, King
 „ *hirticalyx*, Ridl. *Allomorphia hirticalyx*, Ridl.
 „ *Curtisi*, King
 „ *macrophylla*, Triana. *Andromedastrum douglasianus* King
 „ *collina*, Ridl. *Andromedastrum collinum*, Ridl.
 „ *microcarpa*, Ridl. *Allomorphia rosea*, Ridl. Journ.
 Fed. Mal. States Mus. ii. 14. Not of Trans.
 Linn. Soc.
 „ *rosea*, Ridl. *Allomorphia rosea*, Ridl. Trans. Linn.
 Soc. n. m. 301.
 „ *hispida*, Ridl.

Allomorphia, Bl. includes the shrublets with small inconspicuous flowers and small elliptic fruits. I excluded from King's species *A. Wighti* under the genus *Campinia* (a plant allied to *Breissenia* in the paper above referred to, leaving the type species *A. erigua*, and *A. alata*, Scott. with *A. porphyranthura*, Ridl. *A. erigua*, Jack. Trans. Linn. Soc., xxviii. 74, a native of Penang. It is a low shrublet with white flowers and violet stamens, and is the *A. erigua* var. *minor*, King, but it is quite distinct from the common plant of the South of the Malay Peninsula, a shrub about 6-12 feet tall with greenish flowers in a large panicle. This plant has been confused with it by Clarke, Cogniaux, King, and in fact nearly all botanists since Jack's time. My *Allomorphia capillaris* seems to be a form of *A. erigua*, Bl. It is a native of Perak and the Dindings and differs from the Penang plant in the extremely slender, long branches of the panicle, and is perhaps better classed as a variety of *A. erigua*. The typical plant is confined to Penang where it grows on rocky spots near the waterfall. To this species belongs Wallich's 4048a of his Catalogue (there is no No. 1018 in the herbarium) but 1048b seems distinct in its rather larger flowers and quite round based ovate leaves. It was from Herb. Finlayson without locality. Many of Finlayson's plants are from Siam. I have never seen anything quite like it from Penang or elsewhere.

A. porphyranthura, Ridl. Journ. Roy. As. Soc. Straits Br. 57, p. 39 from Ulu Temengoh resembles *A. erigua*, but the panicle is scurly and the flowers larger. There remains now the commonest species of all, the *erigua* of the later botanists but not of Blume. King and Cogniaux give as a synonym *Melastoma imber*, Roxb. Flor. Ind. ii. p. 105, but the description hardly fits this plant to which is also given the Moluccas as a habitat.

In Griffith's Notulae is a description of a *Sauvella bullata* which Cogniaux makes a species of *Allomorphia* under the name *A. bullata*. The description is very incomplete and though some parts of it would fit the common plant which he must have been familiar with and indeed collected, I do not think it can have been what he intended.

I cannot find in fact that this common and conspicuous plant has ever received any name at all. I therefore propose for it the name *Allomorpha malaccensis* as it is particularly common in Malacca and give a description of it.

***Allomorpha malaccensis*, n. sp.**

A tall plant, usually about 6 feet tall and often more with a slender, woody stem, glabrous all over except for a reddish (when dry) meal over the panicle and petioles. Leaves ovate acuminate, dark green, edge entire, base very shortly cuneate, nerves 5 from base 3 very prominent and 2 outer ones very slender, the transverse nervules conspicuous, elevate, 10 in. long and 6 in. wide, petiole 3-4 inches long. Panicle 6 to 12 inches long and nearly as wide pyramidal, branches lax spreading subwhorled. Flowers umbelled on the ends of the branchlets about 10, or in distant pairs of umbels sessile on the main branches. Flowers small .2 in. long. Bracts lanceolate .1 in. long, caducous. Calyx funnel-shaped, short with 4 short, ovate lobes. Petals smaller, white or greenish. Stamens yellow .1 in. long, anthers acuminate, bases divaricate. Capsule .1 in. long, ovoid narrowed below the dilated calyx limb.

MALACCA, common in woods; NEGRI SEMBILAN, Tampin hill; SELANGOR, Rantau Panjang and Sungai Buloh; PERAK, Gunung Kerbau at 4,000 ft. (*Robinson*). A form with leaves more lanceolate.

Allomorpha subsessilis, Craib of Siam also belongs to this genus, but I should exclude *A. umbellulata*, Hook. fil. of Tenasserim. *A. setosa*, Craib (Siam) *A. hispida*, Kurz and *A. Beccariana*, Cogn. and *A. Griffithii*, Hook. fil., both of the latter seem to be species of *Phyllagathis*.

***Anerincleistus*, Korth.**

The type of this genus is *A. hirsutus*, Korth. to which I add *A. macranthus*, King, and *A. pauciflorus*, Ridl. They are all small trees or tree-like shrubs with a few umbelled flowers in the axils. The venation of the leaves is quite peculiar. The outer slender pair of nerves rises from the base of the blade, the second pair rises from the midrib as much as an inch from the base in *A. pauciflorus* and occasionally the lowest pair does the same. This nervation occurs also in *Pomatostoma*. *A. sublepidotus*, King, is very different from the other species in its panicle of many flowers in whorls but the inflorescence is axillary and the venation of the leaves identical, so I retain it in the genus as well as *A. glomerulatus*, King and *A. Beccari*, *A. cordata*, Stapf, and *A. anisophyllus*, Stapf of Borneo, though some of these may be *Pomatostomas*. I exclude all the rest included under this genus by King and myself formerly.

The section *Coriaceae*. (Journ. Roy. As. Soc. Str. Br. 57, p. 45) forms the genus *Oritrephes*, Ridl. and *A. collinus*, Ridl. is referred to *Oxy-spora*. *A. fruticosus*, Ridl. which seems most nearly allied to *Oritrephes*, but has a fruit more resembling that of a *Sonerila* cannot be fitted into any of these genera and I separate it into a distinct genus under the name of *Perilimnastes*.

Perilimnastes, gen. nov.

Shrub, leaves subcoriaceous lanceolate acuminate, flowers 1-3 subumbellate calyx tube little dilate, lobes subulate. Petals 4 lanceolate acute stamens 8 anthers unequal acuminate base emarginate not appendaged, capsule obconic 4 angled smooth, with 4 inflexed valves, as in *Sonerila*. Species 1, *Anerinoleistus fruticosus*, Ridl.

PAHANG.

Sonerila patula, n. sp.

A much branched spreading shrub about 12 in. tall, branched from the base, stems hairy with dense appressed hairs. Leaves lanceolate, acute with base acute, appressed hairy all over, subequal nerves 3, lowest leaves biggest 1.75 to 2.5 in. long, .3-.5 in. wide, petiole .1 in. Cymes chiefly solitary axillary in leaf axils and between the branches, peduncle 1 in. Flowers small, white 2-3 in a cyme. Calyx campanulate, lobes lanceolate acute, subulate. Petals triangular acuminate .1 in. Stamens 3, anthers elliptic blunt. Capsule trigonous turbinate, smooth, .2 in. long, pedicel stout .4.

PAHANG: in forest at Wray's Camp Gunung Tahan at 3,300 ft. alt.

The leaves of this are occasionally markedly unequal in size. It is allied to *S. albiflora*, Stapf, but its narrow leaves and spreading branches make it unlike anything in the Malay Peninsula.

Sonerila belluta, n. sp.

A delicate unbranched herb, 2-4 in. tall, base creeping quite glabrous. Leaves crowded at the top, narrow, lanceolate, subacute, narrowed to the base spine-toothed on the margin, dark green above, pale beneath .75 to 1.25 in. long .2 in. across, nerves pinnate ascending about 4 pairs, petiole very slender, .3 in. long or less. Flowers about 5 cymose on a slender peduncle .75 in. long. Calyx slender cylindric, campanulate teeth short, triangular, green. Petals oblong cuspidate rose-pink .2 in. long. Anthers short, acuminate. Capsule smooth, obconic gradually narrowed to the pedicel .2 in. long, pedicel .1 in.

JOMOR, on rocks on Gunung Banang near Batu Pahat (Ridley 11102).

Allied to *S. sarosa* of Penang Hill, but the leaves are much narrower, the fruit smaller and it is quite glabrous.

***Sonerila setosa*, n. sp.**

Stem over 8 in. tall, densely bristly, hairy as are the petioles, nerves beneath, and edge of leaf, inflorescence and calyx, slightly woody. Leaves very dissimilar, large one elliptic, oblong, acuminate base narrowed, unequally cordate, sprinkled with coarse hairs above membranous, nerves ascending from the lower third of the midrib, transverse nervules fine, conspicuous, 4.5 to 5 in. long, 1.5-2 in. wide. Petiole 1-1.5; small leaves orbicular, reniform 1 in. long. Cymes dense, many flowered in all the axils of the small leaves and terminal about an inch long, densely setose, with red bristles. Flowers small, white. Calyx 1 in. long cylindric, campanulate, red. Petals small, linear, oblong, acute, bristly. Stamens 3, anthers oblong obtuse. Capsule campanulate, muricate, bristly .1 in. long, .2 in. wide, narrowed to its peduncle .2 in. long.

PAHANG, on Gunung Tahan (Ridley 16036).

Allied to *S. caesia* for a form of which I first mistook it.

***Medinilla rubicunda*, Bl.** was based on Jack's *Melastoma rubicunda* which is *Pogonanthera pulverulenta*, Bl.

No type specimen of Jack's seems to exist but in Wallich's collection No. 4086, is a specimen of *Pogonanthera* collected at Cape Rachado in Malacca (not Penang as Cogniaux gives it) which is queried for *Melastoma rubicunda*, Jack, by Wallich, as also is a *Medinilla* from Sylhet. Jack's plant was collected at Singapore. Cogniaux gives *Medinilla rubicunda*, Bl. as a species and compounds it of the Sylhet plant *M. erythrophylla*, Lindl. (*Melastoma erythrophylla*, Wall. Cat. 4085) and Jack's species. *M. rubicunda*, Bl. therefore goes out as a synonym of *Pogonanthera pulverulenta* and the Sylhet plant which does not occur in the Malay Peninsula, retains the name of *M. erythrophylla*, Lindl.

Medinilla venusta, King is apparently a somewhat variable plant. King described it as having 8 stamens and acute petals. His type specimens in the Herb. Kew have 8 stamens but I would not call the petals acute, they seem to be rounded. Stapf in Kew Bulletin, 1906, p. 73 describes under *M. chionantha*, a plant which was sent from Perak by Curtis and cultivated at Kew. It has round petals and 10 stamens, but except for the latter character it is quite like King's. *M. venusta* from Perak, I conclude it is a variety.

Memecylon Cantleyi, n. sp.

A large shrub, bark of branches pale. Leaves thin, coriaceous drying greenish, elliptic, acuminate to both ends equally; nerves 5 pairs, very faint on both sides, 3.5-4.5 in. long, 2-2.3 in. wide, petiole 1 in. long. Flowers few in axillary simple cymes .5 in. long. Peduncle .15 to .2 in. long, rather thick pedicels half as long. Calyx wide cupped, rather flat when expanded, narrowed to base, truncate or very minutely dentate .1 in. long, .15 in. wide, white with a pale violet tinge. Petals (cuspidate in bud) pale blue, subquadrate shortly apiculate below apiculate above, nearly .3 in. across. Stamens deep violet, ovary with 12 ovules crowned by an elongate punctate style. Fruit not seen (there is some in a capsule with one of Maingay's specimens (which are all in flower but being detached it is probable that they do not belong).

SINGAPORE: (Cantley): Garden jungle (Ridley 13012).
MALACCA (Maingay).

This was named *M. laccigatum*, Clarke and *M. garcinoides* by King in Herb. Kew, but it seems to me abundantly distinct, not only in the longer, narrower leaves but in the much larger flower. I have taken part of the description from Maingay's mss. notes. He adds that it is a remarkably elegant, large shrub in flower.

Memecylon longifolium, n. sp.

Tree, branches with grey bark. Leaves elliptic, lanceolate, long, cuspidate tip blunt, narrowed to the rounded base nerves about 20 pairs, the secondary ones being nearly as prominent as the primary ones, but all slender and not prominent inarching 4 in. from the margin, thinly coriaceous, light green when dry, 7-8 in. long, 2-2.25 in. wide, petiole very short .05 or less. Flowers in very short .2 in. axillary sessile fascicles about 10 in. a fascicle, very small pink, pedicels .05. Calyx at first subpyriform with four short rounded lobes eventually campanulate, truncate .1 in. long. Petals ovate triangular subobtuse.

Dindings, Lumut (Ridley 9455). Referred by King to *M. amplexicaule*, Roxb., but the leaves are not cordate and the flowers much smaller. It is certainly allied to this species as also to *heteropleurum*.

Memecylon gracilipes, n. sp.

Small tree with slender, grey twigs, slightly winged below the nodes. Leaves thinly coriaceous drying green, almost sessile ovate, cuspidate base round, midrib beneath elevate as are 4-5 pairs of conspicuous nerves depressed above inarching .25 in. from the edge 2.5 to 3 in. long, 1.5 in. wide. Cymes very slender 1-1.5 in. long, lower ones once branched, upper

ones simple, peduncle very slender .5 in. long, pedicels .2 in. long, very slender. Flowers umbelled, 3. Calyx .1 in. long, the base subglobose, the limb wide saucer-shaped .2 in. across, teeth minute, petals ovate, acute .1 in. Style rather long. Fruit globose .5 in. through on a pedicel .45 in. long. Seed globose testa brown shining.

PERAK, Waterloo Estate 1,000 ft. (Curtis 1295).

The only plant at all like this is *M. arnottianum*, Thw. of Ceylon but that has 3-nerved leaves. The petals appear to have been white, the calyx tinted red.

M. terminale, Dalz. of Southern India also resembles it but shows no nerves.

Memecylon floridum, n. sp.

Tree 40 to 50 feet tall, branches subterete, fuscous. Leaves thin, coriaceous, lanceolate acuminate, nearly equally to both ends, tip blunt, nerves very faint on both sides, a faint intramarginal nerve along each edge rising from base, laterals about $\frac{1}{2}$ pairs 3-4 in. long by a 125 wide, petiole winged nearly to base .3 in. long. Cymes 1-3 in the axils of each leaf, peduncles thick .3 in. long, bearing an umbel of three or more flowers on thick .1 in. pedicels, with lanceolate, blunt bracts at base. Calyx base cylindric obconic limb broad, in bud widely cupular, in flower .1 across. Petals ovate, in bud conic blunt. Style long and stout.

PERAK, Larut 500-1,000 ft. Nov. 1882 (Kunstler 3551).

I cannot fit this plant into any described species, the larger flowers, and short, dense cymes and the long acuminate leaves showing a distinct pair of intramarginal nerves, seem to keep it distinct from anything.

Memecylon malaccense, Clarke mss.

M. amabile, Bedd. var. *malaccensis*, Clarke Flor. Brit. Ind. ii, 555.

Probably a shrub, with slender, grey angled and faintly winged branches. Leaves ovate, lanceolate, base rounded tip acuminate, blunt, fleshy coriaceous opaque, drying brown above reddish beneath with no visible nerves on either surface, 2-2.75 by 1-1.25 in. wide, sessile or with a minute petiole. Cymes very short, .3 in. long, peduncle .15 or much shorter. Flowers 4-5 umbelled on the end of the peduncle. Calyx cup-shaped, truncate with a broad base, fleshy (drying black). Petals forming a blunt cone in bud, ovate.

MALACCA (Maingay 2531, 2528) "Nepus Kolite" (Nipis Kulit).

The specimens of this are very poor, and King puts it under the doubtful species. In the branches and form of the flowers it suggests an affinity with *M. fruticosa* but its opaque nerveless small leaves make it quite distinct. I cannot place it under any of our known species.

Memecylon laxiflorum, Wall. Cat. 4472. A large shrub with grey branches. Leaves stiffly coriaceous ovate, obtuse or acuminate, base round, nerves very faint and slender about 8 pairs when dry, dark above, reddish below 4-4.5 in. long, 2-3 in. across, petiole 4-5 in. long, stout. Cymes 1-4 from axil of fallen leaves. Peduncle .3 in. long bearing a number of cymules on short pedicels .1 in. long with longer, slender pedicels .2 in. long. Calyx campanulate, base hemispheric, limb larger, truncate. Petals 8, short, subacute, blue. Fruit globose with very little trace of the calyx limb, .25 in. through on a cyme 2.5 in. long.

SINGAPORE (Wallich 4472). JOHOR: Minyak Buku (Ridley 11092) and Pinerong (Ridley 15396). PENANG: Beach behind Muka Head (Curtis 723).

This seashore shrub differs from *M. oleaefolium*, Bl. in its stiffer, round leaves with a longer petiole and fewer pedicels with shorter cymes. The nerves though slender and not elevate are quite visible, they inarch into a lateral nerve close to the margin.

Memecylon amplexicaule, Roxb. Fl. Ind. ii. p. 260.

A specimen of this plant so labelled by Roxburgh occurs in the British Museum, and is certainly *M. microstomum*, Clarke. Roxburgh's description agrees perfectly with the specimen and does not at all agree with the plants put under this name by Wight, Clarke, King or other botanists. Roxburgh states that his species is veinless which is the case in *microstomum* but the species named *amplexicaule* by other botanists has peculiarly strongly developed veins on the leaf. Wight's plant so named in Icones 279, is not Roxburgh's and may be *M. Wightii*, Thw. of Ceylon. *M. depressum*, Benth. Wall. Cat. 4101 was never described. There are 2 or three plants mixed under the number 4101 and it is impossible to guess which Bentham intended, nearly all Wallich's specimens labelled *M. amplexicaule*, Roxb. are the correct plant. His only sheet of the Penang plant *M. amplexicaule*, King, etc.) is labelled doubtfully as *M. grande*, Retz. which it is not. There therefore appears to be no name for this plant, and as King's description is apparently mixed, I separate and describe this plant under the name of *M. Wallichii*. A small tree, branchlets 4-angled, leaves lanceolate acuminate or ovate, base minutely cordate, coriaceous, nerves about 18 pairs inarching .1-.15 in. within the margin, very nearly sessile the thick petiole concealed by the lobes of the leaf at the base, 7-8 in. long,

2.75-3 in. wide. Cyme axillary peduncle .1 stout. Flowers numerous, crowded. Calyx cup-shaped, base blunt, edge truncate, not lobed but minutely-irregular, pedicel stout nearly as long .1 in. long. Petals white or pinkish, broad, ovate, blunt. Style rather stout, short. Fruit black, globose .2 in. through.

M. amplexicaule, King and others not of Roxburgh.

PENANG; (Wallich 4101C.) Experimental Nursery; (Curtis 965 and 457); Moniot's Road (Ridley). PERAK; (Scortechini 231); Larut, 800-1,000 ft. (Kunstler, *M. heteropleurum* var. *olivaceum*, King! and 3058 Kunstler), Waterloo (Curtis 1294).

The Penang plants have long, narrow lanceolate leaves, while those of Perak have shorter, broader, ovate ones, but there are intermediate forms. Generally speaking the plant resembles *M. heteropleurum*, Miq. but that has the leaves very shortly cuneate, never rounded or cordate and the flowers about half as big.

M. costatum, Miq. Verh. Ned. Inst. 1850, p. 29 is recorded by King from Perak (Kunstler 10785); I have not seen this specimen and there is no specimen of Miquel's species from the Peninsula at Kew. King's description differs from Miquel's in "base of leaves rounded or slightly narrowed, not cordate" whereas Miquel's species had cordate leaves, and in "flowers in axillary glomeruli" instead of widely spreading panicle cymes. So it seems clear that King's *M. costatum* is not Miquel's.

RUBIACEAE.

Uncaria parviflora, n. sp.

Uncaria lanosa var. *parviflora*, Ridl. Journ. Roy. As. Soc. Str. Br. lix. p. 109.

Climber with 4 angled stems, .2 in. through, sparsely hairy, branches more densely hairy with short rough hairs. Leaves lanceolate, acuminate, base broad, membranous, scabrid hairy above, beneath velvety hairy; nerves about 7 pairs, slender elevate beneath, 2.75 in. long, 1.25 in. wide; petiole .1 in. Stipules linear acuminate, bifid, hairy .1 in. long. Peduncles rather slender narrowed upwards, sparsely hairy 1 in. long. Peduncles rather slender, narrowed upwards, sparsely hairy 1 in. long. Heads globose .5 in. through. Calyx sessile, silky, obconic, very small with short oblong obtuse lobes about half the length, glabrous within. Corolla sparsely silky, hairy; tube very slender .2 in. lobes oblong ovate blunt, glabrous within.

PERLIS, Chupeng in open country, forming large bushes (Ridley 15019).

On further examination I find that this plant is specifically distinct from *U. lanosa*.

Coptosapelta parviflora, n. sp.

Lobby climber, nearly glabrous. Leaves elliptic rather long, sharply acuminate, base cuneate, dark shining green, glabrous except for a few rather long hairs on the midrib, nerves 4 prs., fine, reticulations visible on both sides, 3-5 in. long, 1.5 in. wide; petiole white-hairy .3-.4 in. Stipules triangular acute, .1 in. long. Panicle terminal 2.5 in. long in flower, with thin branches, lax, sparsely white-hairy. Bracts narrow, linear, lanceolate acuminate .1 in. long. Flowers green. Pedicels white-hairy .1 in. long. Calyx .1 in. obconic ridged, white-hairy, limb campanulate about as long with 5 ovate lobes. Corolla-tube cylindric .2 in. long, white, silky, lobes linear, oblong, nearly as long, glabrous keeled, mouth of tube white-hairy. Stamens hairy. Fruit panicle 3 in. long 6 in. across. Branches angled, nearly glabrous. Fruit .2 in. long, globular, ovoid.

SINGAPORE, Bukit Timah (*Ridley* 14117). PENANG: (Curtis) BORNEO: Sarawak (*Beccari* 2518).

This species differs in being subglabrous and having the flowers much smaller in a short terminal panicle. The fruit is also smaller and quite glabrous.

Argostemma rugosum, n. sp.

Stem fleshy, branched, erect 4 inches or more, transversely rugose as are the petioles and midrib, hairy. Leaves very unequal, larger one oblong or elliptic, shortly acute, base rounded or cuneate, unequal glabrous above, nerves hairy beneath 10-11 prs., reticulations conspicuous 2-3 in. long, 1-1.5 in. long, petiole .2 in. long. Small leaf, lanceolate, subacute .2 in. long. Stipules lanceolate acute, as long. Peduncle 1 in. or less with an umbel of several large flowers on pedicels .5-1.5 in. long. Bracts at base of umbel lanceolate. Calyx-tube short, campanulate, with lanceolate acute lobes, much longer, .2 in. long. Corolla .8 in. across lobes oblong, lanceolate subacute. Staminal column shorter curved.

SINGAPORE: Gunong Meugkuang 3,600 ft. (*Kloss*).

I took this at first for an abnormal specimen or variety of *A. spinulosum*, Clarke, but in view of the greater size of calyx lobes and corolla, which is longer, not shorter than the staminal column, I conclude it is a distinct species.

Argostemma nervosum, n. sp.

Stem rather woody ascending for 8 inches, dense, hairy, rather stout. Leaves very unequal, large ones sessile, oblong, oblanceolate, abruptly acute, narrowed to the unequal rounded base, membranous above with pale hairs scattered sparsely and thicker on midrib; nerves 11-12 prs., conspicuous both sides much elevate parallel and hairy beneath, reticula-

tions hardly visible 2.5 in. long, 1.25 in. wide, small leaf, sessile, ovate acute sessile .5 in. long 13 in. wide edges hairy.

Stipules similar smaller. Cymes terminal and in upper axils densely hairy up to calyx. Peduncle .25 in. long, pedicels 1.5 in. long. Flowers in pairs. Calyx campanulate, dense, hairy lobes short, toothlike. Corolla .6 in. across lobes narrow, lanceolate, acuminate, hairy on the back. Staminal cone slightly longer. Fruit globose campanulate .2 in. long, hairy.

SELANGOR, Semang, Mines (*Ridley* 15658).

Near *A. chotostemma*, Hook. fil., but a much stouter plant very hairy all over, with stiffer leaves, larger, sessile, and strongly nerved but not reticulate. Cymes with short peduncle, long pedicels and flowers hairy.

***Argostemma grandiflora*, n. sp.**

Ascending herb, 5 m. tall, glabrous, entirely except a little hairiness on stem. Leaves unequal, larger ones lanceolate, fleshy or ovate lanceolate, narrowed to both ends, nerves invisible .14 in. long, .3-.4 m. wide; petiole slender .1, small leaves ovate lanceolate .2 m. long, .1 m. wide. Stipules similar. Flowers solitary, terminal, and in upper axils peduncle 1.5 in. long with 2 pairs of bracts, one obcuneate toothed and .2 in. long and one smaller, three-toothed, ovate .1 in. long above. Calyx tube short, obconic, lobes narrow, linear, lanceolate acuminate .15 in., glabrous. Corolla .7 in. across, lobes ovate acute .2 in. across. Staminal column shorter .2 in. long, thick.

PERAK: Gunong Kerbau 4500 ft. (*Robinson*) a single specimen.

I took this for an abnormally glabrous specimen of *A. involucreatum*, Hemsl., but it differs so markedly in its nerveless fleshy leaves, the curious involueral bracts, all toothed conspicuously, and the large broad lobed corolla that it must be considered distinct.

***Argostemma trichanthum*, Ridl.**

Whole plant 4 inches long, stem ascending, hairy, with curled viscid hairs. Leaves very unequal, larger one lanceolate, subacutely acuminate narrowed or not to unequally cordate base, membranous, glabrous above, sparsely hairy beneath, more so on the midrib and on the seven pairs of slender nerves 1.75 in. long, to 3 m. long, 1-1.5 in. wide; petiole hairy .1, small leaf ovate, acute, base round .12 in. long. Stipules resembling the small leaf. Cymes several in the uppermost axils 1.5-2 in. long, hairy all over, peduncle .5 in. and branches several, slender. Bracts oblong, lanceolate .1 in. long, glabrous. Calyx campanulate, lobes short, ovate, triangular, hairy. Corolla lobes narrow, lanceolate, acuminate, backs hairy, .2 in.

long. Stamens nearly as long, acuminate. Fruit campanulate, hairy.

SELANGOR, Ulu Langat (*Kloss*).

The leaves appear to have a white longitudinal fascia as in *A. elatostemma* and other species.

Nearest to *elatostemma*, but the leaves acuminate, lanceolate, the flowers more numerous and smaller and the whole inflorescence more hairy.

***Mussaenda spectabilis*, n. sp.**

Shrub. Branches hairy with many linear lenticels. Leaves chartaceous ovate—oblong base round abruptly short, acute cuspidate, above glabrous except the midrib, beneath thickly sprinkled with short hairs, midrib and nerves about 10, slender rather faint pairs, appressed-hairy, 5-6 in. long, 2.25-2.75 in. wide; petiole 1.25. Stipules triangular, setaceous densely hairy; Cymes terminal several, densely hairy, peduncles about 1 in. long, generally two branched. Bracts lanceolate acuminate, hairy. Calyx-lobes lanceolate acuminate, subfalcate 1 in. long unequal, hairy .1 in. across or less. Corolla tube densely hairy 1 in. long, limb 2.25 across, lobes 1.1 long .5 inches across pubescent on the back, puberulous velvety above, the mouth with short dense yellow hairs running from the centre up to the midrib of each petal.

PAHANG: Pulau Tioman (*C. B. Kloss*, June, 1916).

A very fine species allied to *M. mutabilis* var. *hirsuta* but the flowers are considerably larger and much more hairy and the calyx lobes are very much longer and as long as the corolla tube. The leaves though usually round at the base are occasionally narrowed.

***Urophyllum coriaceum*, n. sp.**

Small branched tree with white corky bark. Leaves coriaceous elliptic or oblong acuminate, cuspidate, base very shortly narrowed quite glabrous; nerves about 12 pairs, elevate as are the reticulations on both sides; midrib depressed above 3.5-6 inches long 1.5-2 in. wide; petiole .5 in. long. Stipules short lanceolate acuminate blunt. Cymes few-flowered about .4 in. long including .2 in. long peduncles. Calyx widely cupular .05 in. long, .1 in. wide truncate, entire. Corolla .15 in. long coriaceous, tube very short, lobes 5, splitting nearly to the base, acute, hairy within at the mouth; Anthers narrow, linear, acute. Style very short, stigma fusiform.

PAHANG: Gunong Taban at Wray's Camp, (*Ridley* 16247, 16070).

This shrub or small tree had much the habit of an elder-bush with stout branches from the base covered with white

corky bark. It was about 8 or 10 ft. tall. In life the leaves and flowers suggested those of *U. glabrum* but they are much more coriaceous, the flowers larger and rigid, the edges of the petals run down nearly the whole length of the corolla as ridges, and are separate or nearly separate for most of the way. The whole plant is almost completely glabrous.

***Randia (Ceriscus) oocarpa*, n. sp.**

Shrub. Branchlets slender, long, white-barked, spines on the lower part only, 1 in. or less, terminal branchlets short, distant 1 in. long, knotted. Leaves membranous ovate to oblong, obtuse or subacute base narrowed or lanceolate 1-3.5 in. long, .5-1.25 in. across; nerves about 4 pairs, slender elevate beneath, thickly sprinkled by short hairs on both sides, especially hairy on midrib both sides and nerves, bigger leaves becoming glabrescent; petiole hairy .1 or less. Stipules ovate, acuminate keeled. Flowers 1-2 terminal, white, becoming orange; pedicel .05 in. hairy. Calyx .3 in. densely rather long hairy lobes, ovate, less than half as long, in flower. Corolla as long as calyx-tube, short, thick, hairy, white becoming orange-coloured. Fruit obovoid 2 in. long, 1.75 in. wide, rough when dry, glabrous.

PAHANG: Pekan (*Ridley*). PERAK: Relau Tujor (*Wray* 2599a); Taiping (*Scortechini*). KEDAH: Lankawi, Kwah (*Curtis*), Buran (*Ridley* 15016). PERLIS: Kanga (*Ridley* 15007).

This plant was identified by King with *Randia Dumetorum* Lam., a native of India, and following the Flora of British India he gives as synonyms a large number of what I should consider distinct species. The nearest species to this is *R. stipulosa*, Miq. of Java, which he gives as a synonym, but that has smaller leaves and larger flowers with larger calyx lobes. From the true *R. dumetorum* of Lamark, this species differs in the thinner, larger leaves, and smaller flowers, more lax habit and smaller and scantier thorns.

***Randia incurva*, n. sp.**

A tree. Leaves thinly coriaceous, elliptic, shortly acuminate, base cuneate, nerves 9 pairs, the lowest very fine from the base, the others widely inarching .2-4 in. from the edge, reticulations wide 7.5-8 in. long, 2.75-3.25 in. wide; petiole .3 in. long, stipules triangular mucronate. Cymes panicle terminal 2.5 in. long and wide, peduncle .3 in. long and like the branches, woody. Flowers numerous, fragrant. Pedicels .1-2 in. long, pubescent. Bracts small, ovate. Calyx campanulate, pubescent .2 in. long with very short teeth. Corolla cylindric, rather narrow .3 in. long, lobes oblong rounded .1 in. long. Anthers linear. Stigma cylindric, thick, shorter than lobes.

PENANG: West Hill at 1,000 ft. (Curtis No. 818).

This is one of the species included under *R. Forbesii*, King, by King and Gamble in the materials, but it is utterly different from the other plants on which the species is based. It is an unarmed tree, *Forbesii* a climber. The foliage is quite different, that of *Forbesii* being coriaceous with only the primary nerves visible, those of *R. incurta* are thin, large with very conspicuous, anarching veins. The calyx of *Forbesii* is cylindric truncate, the corolla tube nearly twice as long, the lobes narrower and smaller.

R. longiflora, Lam. Dict. ii, p. 227, Ill. t. 156 f. 3.

Though there can be little doubt as to which species Lamarck intended, there has been a great mixture made under this name in the Flora of British India. This appears to have been due in the first instance to De Candolle, who thought that *Posoqueria longiflora*, Roxb. was Lamarck's *R. longiflora*. To this species Hooker in Flora of British India has added (1) *R. scandens*, Dec. *Tocoyena scandens*, Bl. and (2) *Gardenia patula*, Horsfield, both utterly different plants. *R. longiflora*, Lam. is the thorny, half scandent bush, so common in the tidal swamps of the Malay Peninsula. It occurs also in Borneo, and is absent entirely from India. The Indian plant is totally different, and does not seem to have any name. The only evidence of its occurring in the Malay Peninsula is Wallich's specimen numbered 8281 D, collected by him in Singapore in 1822.

Randia Roxburghii, n. sp.

A glabrous, woody climber with numerous recurved spines .5 in. long in pairs at each node, bark whitish. Leaves coriaceous, elliptic, shortly acuminate, blunt, base cuneate, nerves 4 pairs depressed above, raised beneath slender, secondary nerves and reticulations invisible, 4 in. long, 1.75 in. 1.8 in. wide; petiole .2 in. long. Cymes nearly all axillary lax, peduncle .3 in. long branches spreading few about as long. Bracts small, ovate, persistent. Pedicel nearly .1 in. long. Calyx urn-shaped, narrowed at the base with triangular, short teeth .2 in. long. Corolla tube 1 in. long, cylindric, lobes broad, oblong, subacute .4 in. long, .1 in. wide. Fruit globose, ribbed, about 5 in. long, crowned with the remains of the calyx.

SINGAPORE: (Wallich 8281 D), (Lobb). *Chittagong*, ASSAM (Jenkins). *Silhet* (Wallich 8281 B).

It is quite possible that Wallich's plant came from Chittagong and another specimen in Herb. Hooker is labelled "Chittagong (Wallich) 8281 D." but there is a ticket on the specimen in Wallich's own herbarium saying *he got* it in Singapore. It has not been met with in the Peninsula since.

Gardenia elata, n. sp.

A very big tree nearly 100 ft. tall. Leaves subcoriaceous oblanceolate, apiculate, base cuneate, nerves 17 pairs, subhorizontal, with transverse nervules all elevate beneath, 9 in. long, 3.5 in. wide, petiole 1 in. long. Stipules connate in a tube with a bifid unequal limb, .2 in. long. Flowers solitary, terminal subsessile. Calyx tube funnel-shaped .3 in. limb spathaceous prolonged on one side into an oblong lobe .5 in. long. Corolla tube 3 in. long, lobes oblong spathulate tip rounded, orange color. Stigma thick fusiform clavate.

SINGAPORE, Bukit Timah (*Ridley* 11332). PERAK, Selama (*Wray* 4266). BORNEO, Baram (*Hose* 229).

Entirely glabrous except the very young leaves which are pubescent.

Petunga conifera, n. sp.

A slender tree about 30 ft. with few spreading horizontal branches 4-angled. Leaves coriaceous, dark green, elliptic cuspidate, shortly narrowed at the base, nerves prominent beneath 7-9 pairs, nervules very fine and inconspicuous, 6-9 in. long, 3-5 in. wide, petiole thick .5 in. Raceme dense .5 in., few flowered, cone-like, 4-angled heads. Bracts ovate, coriaceous ciliate along the edge, nearly as long as sessile flowers. Calyx obconic with 5 short broad triangular lobes densely woolly hairy at tips .15. Corolla .15 in. long tube short, thick glabrous outside, pubescent within, lobes oblong blunt as long as the tube, hairy at tips. Anthers linear, sessile on the mouth of tube. Style as long as calyx lobes, stigmas 2, thick linear blunt, all pubescent.

Apparently rare. SINGAPORE in the Garden Jungle. (*Ridley* 10722).

Timonius hirsutus, n. sp.

Small shrub with slender purplish brown twigs, young parts with long white hairs. Leaves membranous on the ends of bare shoots, lanceolate acuminate, base rounded, nerves 7 prs. elevate beneath sparsely short-hairy on nerves above, and sparsely hairy beneath, nerves and midrib with dense appressed hairs 3-4 in. long, .5-1.25 in. wide, petiole very hairy .12 in. long. Stipules triangular elongate, acuminate, setaceous, glabrous .4 in. Cymes hairy axillary in the uppermost axils .6 in. long. Peduncle slender .25 in. long. Cymes in pairs 3-flowered, outer flowers, with pedicel .1 in. long, central flower sessile. Calyx very small, campanulate, lobes linear as long as tube. Corolla white .25 in. long, tube very slender, lobes very short oblong, blunt, white, silky all over but the back of the lobes long-bearded.

Curtis collected this without fruit or flowers in the Laukawi Islands (No. 2541) I made a note on it in Journ. Roy. As. Soc. Str. Br. 59, p. 115. Now good flowering specimens come from Pulau Davang Bunting collected by H. C. Robinson, No. 6229 of his collection labelled "small bush flowers, white." The hairs on this plant are described by me as red, the foliage was however, older. In Robinson's specimens the leaves are mostly hardly developed and the hairs are white and silky.

***Coffea viridiflora*, n. sp.**

Shrub glabrous 12-14 ft. tall. Leaves fleshy, membranous elliptic, oblong, cuspidate (cusp blunt 1 in. long) nerves 8-9 pairs, slender ascending, midrib channelled above, base cuneate decurrent on the channelled petiole, 8 in. long, 3 in. wide; petiole rather thick 15 in. Stipules caducous. Flowers in axillary heads in each leaf axil, sessile or shortly peduncled, few green. Calyces connate in a head sessile gummy. Corolla .2 in. long, tube cylindric, lobes linear acuminate 4, contort half as long. Anthers shortly projecting, rather large. Fruit globose .3 in. through crowned with circular calyx scar. Seeds 2 semi-oblong, back round, front flat .2 in. long.

SELANGOR: Batu Caves (*Ridley*). PERAK: Waterloo (*Curtis* 1304).

***Ixora montana*, n. sp.**

A shrub with pale bark. Leaves coriaceous, oblong ovate base round, nerves over 12 pairs, strongly elevate beneath as are the reticulations, over 6 in. long, 3.5 in. wide, petiole .2 in. Coriamb dense, many-flowered, 4 in. across, peduncle 6 in. long with a pair of sessile ovate acuminate leaves 2.5 in. long, 1 in. wide at base. Bracts linear, acuminate. Branches hairy. Calyx glabrous, tubes subglobose small with shorter ovate acute teeth. Corolla light red, tube .75 in. long, lobes broad, oblong, rounded.

PERAK, Gunong Kerbau (*Uniff*).

The specimen is very imperfect but it seems quite distinct from *I. opata* which is the nearest thing to it.

***Ixora grandifolia*, Zoll & Moritz Verz. 65.**

Under this name Hooker and King have collected a variety of species forming a group of species rather than a single one. Among the plants thus included by King are *Ixora grandifolia*, Zoll. and Mor. a big tree with white flowers, of which he describes a variety *gigantea*, but I see no difference between this variety and his type-species (which is not Zollinger's plant) and is described below. Next comes his variety *coriacea* in which following Hooker he includes at least two distinct

species, one the comparatively thin leaved plant with rose-pink flowers, the *I. coriacea* of Brown in Wallich's Herbarium No. 6151 the other a thick leaved plant with dense corymbs of white flowers collected by Griffith in Malacca. All the species want describing.

***Ixora coriacea*, Br. in Wall. Cat. 6151.**

Apparently a tree. Leaves coriaceous, elliptic acuminate acute base shortly narrowed and blunt, nerves about 12 pairs sunk above, elevate beneath, 10 in. long, 3.5 in. wide; petiole thick .5 in. long. Stipules broad, coriaceous, ovate truncate rounded, mucronate. Cyme panicles 3 terminal, peduncles 2.5-3 in. long, panicle 4 in. across, 3 in. long, branches puberulous. Calyx tubular, urn-shaped .05 in. with very short teeth. Corolla rose-pink, tube slender, .4 in. long, lobes oblong deflexed. Style fairly long, slightly clubbed. Fruit bilobed 2-seeded .25 in. through.

PENANG (and SINGAPORE) Wallich 6151; Phillips and I believe that *I. elliptica*, Br. PENANG, Wallich 6153 is the same species.

***Ixora crassifolia*, n. sp.**

Tree. Leaves very thick coriaceous and smooth, shining, elliptic lanceolate, blunt base, narrowed, nerves about 10 pairs, often deep-sunk above, elevate beneath, midrib stout, 8-9 in. long, 3-3.5 in. wide, petiole thick .25 in. Stipules broad, triangular mucronate. Inflorescence of several stout branches, thickly short, hairy with dense umbellate cymes of white flowers crowded together 3 inches long, 4 in. wide primary peduncles very short. Calyx subcampanulate with small rounded lobes. Corolla .4 in. long, tube slender, lobes narrow nearly as long, white, base red.

MALACCA, Ayer Panas heavy jungle (*Griffith*).

All the specimens are in bud or fruit.

***Ixora patens*, n. sp.**

Leaves elliptic, lanceolate, acuminate, acute, base narrowed, thin coriaceous, nerves fine about 18 pairs, secondaries nearly as prominent, midrib elevate 7 in. long, 2 in. wide, petiole .25 in. long. Corymb spreading, 5 branches, 2 lower ones with peduncle 2 in. long, spreading horizontally, the upper 3.1 in. from them, forming an umbel with small lanceolate bracts at base, peduncles one inch, all the cymes of several branches about one inch long, many-flowered, branchlets very short. Flowers sessile. Calyx suburceolate with very small teeth. Corolla tubes slender .3, lobes half as long, rounded at tip.

SELANGOR: Gunung Mengknang Lebar 5,000 ft. (*Robinson*).

I am not sure of the color of this but it seems to have been red. All this set differs entirely from King's *grandifolia* and his variety *arborescens*, in having the base of the leaf narrowed to a point. The variety *arborescens*, Hook. fil. has as a synonym Hasskarl's, *I. arborescens*, Retzia l. p. 22 which is a distinct species, *I. gigantea*, *Ixora grandifolia*, Hook. fil. and King not of Zollinger.

Tree to 60 to 80 feet tall, 15-20 in. through with spreading branches. Leaves very coriaceous, elliptic, tip round, base round, 10 in. long, 5.5 in. wide or less, nerves prominent about 6 pairs, petiole thick 1 in. long. Panicles 2 lax, peduncle 2 in. or more long, pubescent as are branches. Corymb 2 in. long and wide. Flowers shortly pedicelled, Calyx campanulate, 5-toothed. Corolla not seen. Fruit globose, pea-shaped, .15 in. through, bright red.

PERAK, Larut, (*Kunstler* 5609, 5466; Wray 2973).

The leaves of the true plant of Zollinger are less coriaceous much smaller and narrowed at the base, the inflorescence much smaller. In fruit the inflorescence of *gigantea* becomes stout and woody and is as much as 8 inches long, the peduncle nearly .25 in. thick.

Ixora fluminalis, n. sp. *I. grandifolia* var. *arborescens*, King not *I. arborescens*, Hassk.

A tidal river tree, leaves coriaceous, stiff, oblong blunt, base rounded sometimes nearly cordate 4-6 or 7 in. long, 2-4 in. wide, nerves 10 pairs, prominent, midrib prominent beneath; petiole thick .25 in. Panicles 3, central one rebranched peduncle 2 in. long, whole inflorescence 5 in. long, 6 in. across, puberulous. Bracts at base ovate, acuminate .25 in. long. Flowers pedicelled, yellow. Calyx nectolate shortly 5-toothed. Corolla tube cylindric, slender, .24 in. lobes oblong, rounded .12 in., reflexed. Stigma bifid. Fruit globose pea-shaped, in a much thickened and enlarged corymb.

Tidal rivers, Common. JOHOR, Kota Tinggi (*Ridley* 4165). MALACCA (*Griffith*, *Cunning* 2332, *Maingay* 1297). PERAK, Gopeng (*Kunstler*). KEDAH, Lankawi, Gunung Rava, (*Aniff*).

The true *arborescens* of Hasskarl, of which there is a cotype in Herb. Kew, has thinner leaves narrowed at the base. The inflorescence more slender and lax. Calyx lobes larger. Corolla more slender with narrower lobes and said to be white. In fruit the panicle though longer is not so thick as in *I. fluminalis*. The bracts at base of inflorescence are more lanceolate.

***Lasianthus bractescens*, n. sp.**

A shrub. Branches midrib above and nerves beneath and inflorescence hairy. Leaves oblong, long-acuminate, often abruptly, base rounded, sometimes slightly unequal, thinly membranous, sparsely hairy above, more densely beneath, nerves 12 pairs, fine elevate beneath, 6 in. long, 1.5 in. wide, petiole .05 in. long. Stipules lanceolate, acuminate, densely hairy. Heads .2 in. across, surrounded by lanceolate acuminate bracts, hairy on both sides .3 in. long. Calyx lobes narrow, lanceolate, acuminate, hairy. Corolla white, much longer, glabrous except the mouth, white-hairy, tube slender, cylindric .25 in. long, lobes short, blunt.

SELANGOR, Batu Caves.

var. *rosulatus*. Leaves oblong sessile, broad, bases unequal. Bracts ovate acute forming a rosette round the flowers, each 1 in. or more long.

PERAK, Telok Pinang, Lenggong, Temengoh.

This closely resembles *Lasianthus pilosus* but differs in the large and conspicuous bracts.

***Lasianthus crassifolius*, n. sp.**

A stout woody shrub. Young branches puberulous. Leaves stiff, coriaceous, above glabrous and shining, elliptic lanceolate, acuminate cordate, blunt, base short, narrowed, nerves 9-12 pairs, thin, elevate, puberulous when young, reticulations conspicuous 7 in. long, 2 in. wide, petiole .4 in. long, pubescent. Stipules small, triangular. Cymes few-flowered on woody peduncles .2 in. long. Bracts small, ovate, hairy. Flowers sessile .15 in. long. Calyx very short shallow, lobes small spreading hairy. Corolla silky-hairy, lobes short. Fruit ovoid narrowed at base, tip hairy .1 in. long when dry.

MALACCA: (Maingay). SELANGOR; Sempang mines (Ridley 15689).

***Lasianthus politus*, n. sp.**

Shrub. Branches entirely covered with dense tomentose hair as are the petioles, midrib and nerves beneath and inflorescence. Leaves coriaceous, bright shining green above, hairy beneath lanceolate acuminate, base shortly acuminate, nerves faintly depressed above, elevate beneath 6 pairs, reticulations also elevate conspicuous 3-5 in. long, .75 in. wide; petiole thick .4 in. Stipules narrow lanceolate, densely hairy soon disappearing. Heads dense, .2 in. long. Bracts linear, long, hairy. Flowers sessile. Calyx tube short globose, lobes 5 lanceolate linear acuminate densely hairy. Corolla not seen. Fruit globose obscurely 5-lobed, hairy at top terminated by the connivent sepals, .2 in. long.

SELANGOR: Sempang mines (*Ridley*).

***Lasianthus villosus*, n. sp.**

A hairy shrub. The branches petioles, stipules, bracts midrib on both sides and nerves beneath villous. Leaves elliptic, long-cuspidate acuminate, base narrowed, cuneate or more commonly rounded, blunt, glabrous above except the midrib, beneath villous-hairy, nerves 18 pairs, elevate beneath, nervules undulate transverse with some reticulations, 4-6 in. long, 1.5 to 2 in. wide, petiole .1 in. long. Stipules lanceolate, acuminate golden-villous, .2 in. long. Flowers few on a stout peduncle 2 in. long with lanceolate acuminate bracts .15 in. long. Calyx villous, tube subglobose, lobes 4, triangular short, glabrous inside. Corolla glabrous .15 in. long, tube short cylindric, lobes 4 lanceolate as long, a mass of hairs in the mouth. Fruit globose, hairy.

PERAK, Tapah (*Ridley* 14074).

***Lasianthus* (§ *Mephitidia*) *glaberrimus*, n. sp.**

A fetid shrub with slender branches quite glabrous. Leaves membranous, lanceolate acuminate caudate, base cuneate drying black, nerves faint, very fine about 9 pairs, marching boldly .1 in. from the edge, reticulations wide, hardly conspicuous 3.4-4 in. long, 1-1.25 in. wide, petiole .05 in. long. Stipules lanceolate, caducous. Flowers very small two or three in axillary fascicles sessile. Calyx lobes very short, tube campanulate. Corolla .05 in. long, tube slender, lobes valvate, ovary trilocular with 1 ovule in each cell. Style simple, stigma bifid. Fruit blue obconic .1 in. through Pyrenes 2.

SELANGOR: Semangkok Pass (*Ridley* 8574). MALACCA: (*Maingay*). PENANG: West Hill and Moniot's Road (*Curtis* 964). KEDAH: Kedah Peak (*Ridley* 5549).

Clarke suggested that this was a *Saprosma* and says it is not a *Mephitidia* but it does not seem to me to resemble a *Saprosma* at all.

***Morinda elliptica*, n. sp. *M. citrifolia* var. *elliptica*, King and Gamble in Materials.**

It seems most extraordinary that this plant by far the commonest species in the Malay Peninsula, and most abundant in newly cleared ground should be up to the present time nameless, but indeed it is so common and well-known in its habitats that hardly any botanist has troubled to collect specimens. There are only one or two poor specimens in the Kew herbarium and I think none at the British Museum. These specimens have been mistaken for the very different *Morinda citrifolia*, L. or of a variety of it *M. elliptica* a small tree or shrub with pale bark about 12-14 feet tall occasionally larger.

Leaves narrow elliptic or oblanceolate shortly acuminate and long narrowed to base, dull green rather fleshy drying black, nerves about 7 pairs; 5 in. long, 1.25 in. wide, petiole .4 in. long. Peduncles slender 1.25 in. long. Head of flowers .25 in. long, green, flowers white. Fruit head oblong green hardly pulpy .5 in. long, common all over the Peninsula in cleared ground among lalang, and more bushy on rocks by the sea to complete the account of this plant additional specimens are badly needed. It is quite different from *Citrifolia* which has large ovate round leaves, much larger heads of flowers, and oblong white pulpy fruit as big as the fist. This species I have never seen really wild. It is common in Campongs, and is the true Mengkudu of the Malays. It may be a native of India.

Coelospermum biovulatum, Clarke MSS. Herb. Kew.

Leaves thin, coriaceous, not fleshy elliptic abruptly cuspidate acute or shortly acuminate, base cuneate unequal, glabrous, shining above 6 in. long, 2.75 in. wide, nerves hardly visible above, beneath conspicuously elevate inarching .2 in. from edge, reticulations elevate, petiole .7 in. long. Stipules short acute. Peduncle 1.5 in. long with 4 or 5 branches .25 in. long bearing 5-6 terminal umbellate flowers. Calyx puberulous, campanulate with rather a wide rim .12 in. across. Corolla in bud clubbed fusiform, .4 in. tube .3 in. slightly dilate upwards lobes linear recurved, more than as half as long, yellow. Stamen filaments long, projecting. Anthers long, linear curved ovary 2-celled, ovule one in each cell on the middle of the septum.

MALACCA: (*Maingay* No. 3053).

This has been referred by Hooker to *C. scandens*, Bl. and to *C. truncatum* by King. It totally differs from either species in which the texture of the leaves is so fleshy that they dry black and hardly show the nervation. It is apparently a very rare plant as no one but Maingay has collected it.

Psychotria rudis, n. sp.

Shrub, not branched. Leaves elliptic lanceolate, long acuminate, long narrowed to base, membranous sparsely hairy on nerves and nervules above thickly sprinkled with hairs on back, nerves 10 pairs elevate beneath 6-8 in. long, 2-2.5 in. wide, petiole slender, hairy .75 in. Panicle terminal, hairy branches in fruit, slender. Drupe black, oblong 4 angled when dry .24 in. long pyrenes inner face elliptic, flat, back rounded with a keel. Flowers not seen.

KEDAH: Kedah Peak 2,800-4,000 alt. (*Robinson*).

This has the habit of *P. Griffithii* but the leaves are thinner and quite hairy.

***Psychotria setistipula*, n. sp.**

A shrub. Bark pale. Leaves coriaceous lanceolate, glabrous narrowed to both ends, the acumination longest at base from the middle of the leaf, underside paler than upper, nerves 12 pairs, faint, 4.5 in. long, 1.5 in. wide, petiole .5 in. long. Stipules broad oblong truncate with a long setiform cusp rising from the back. Cymes terminal 3, peduncle 2 in. long glabrous branches .5-1 in. long puberulous, bearing 1-3 globose umbelled eximules at the tip .3 in. through. Bracts lanceolate acuminate. Bracteoles usually blunt.

Selangor, Gunung Mengkuang Lebar (*Robinson*).

This plant (only in young bud unfortunately) resembles *P. angulata*, Korth., but the stipules are quite different, the leaves more coriaceous and the inflorescence puberulous.

***Psychotria minutiflora*, n. sp.**

Stems glabrous. Leaves membranous elliptic, lanceolate acuminate, base long, narrowed, drying black, nerves 13 pairs conspicuous elevate beneath 6-7 in. long, 1.5-2 in. wide, petiole slender 1.5-2 in. long. Stipules broad, oblong, abruptly blunt acuminate, comate edge ciliate .6 in. long. Cyme panicle sessile, many-flowered, 1.5 in. long, 2 in. wide. Calyx short cup-shaped, narrowed below the broad short toothed limb. Corolla .05 tubular, short, lobes as long as tube, 5 reflexed, mouth tomentose. Anthers short, filament in mouth of tube projecting. Style longer bilobed with thick lobes at apex. Ovary 2-celled, 2-seeded.

Selangor: Gunung Sempah (*Ridley*).

***Cephaelis*.**

The Malayan species of this genus have been much confused in the Flora of British India and especially in King's Materials. The succulence of the plants makes them often difficult to dry properly and consequently specimens are often troublesome to make out.

C. cuneatum, Korth. This plant a native of Mount Singalan in Sumatra cannot possibly be the narrow leaved plant of Mount Ophir, as it is described by Korthals as having obovate leaves. It is however, so identified in both the works above referred to. I propose for the Mount Ophir plant the name of *Cephaelis angustifolia*, n. sp.

Herbaceous plant, stem slender, not or hardly branched. Leaves linear lanceolate acuminate, long—narrowed to the base, and to the apex from the middle, fleshy membranous, nerves fine, about 15 pairs, slender curved ascending, 6-9 in. long, 1-1.5 in. wide, petiole 1.5 in. long. Stipules comate in a tube with two acuminate points .2 in. long. Peduncle slender

2-3 in. long. Capitulum .75-1 in. across. Bracts ovate orbicular rounded truncate .4 in. long and as wide. Calyx truncate. Corolla honey yellow, tube cylindric curved. Fruit oblong .5 in. long when dry, light blue.

MALACCA, Mount Ophir (all collectors). JOHOR, Gunung Pantai and NEGRI SEMBILAN, Gunung Tampin, a form with broader leaves.

Cephaelis Ridleyi, King and Gamble. This seems to have been based on a plant collected by me at Bukit Kutu in Selangor, a remarkably stout species about 2 feet tall, the stem thick and fleshy, with the leaves all deeply tinted with purple. The flowers also purple. To this I would add a plant collected at Gunung Inas by Yapp at an altitude of 3,500 feet. But the plants collected in Singapore and Curtis's plant from Penang appear to me to be totally different though King and Gamble call these also *C. Ridleyi*.

I would separate them under the name of *C. singapurensis*. Whole plant about 2 feet tall, stem moderately slender. Leaves elongate lanceolate acuminate long—narrowed to base nerves 16 pairs, 9 in. long, 2.5 in. wide, petiole 1 in. long. Stipules connate into a tube with 2 blunt points .15 in. long. Peduncle 1-2.5 in. long. Head about 1 in. across. Bracts outer pair broad, ovate subacute or blunt, inner ones oblong. Calyx very short, truncate. Corolla 1.25 in. long, tube thick, lobes ovate obtuse, all honey yellow. Fruit light blue.

In damp woods. SINGAPORE: Bajan. JOHOR: Gunung Pulai and Gunung Pantai.

Cephaelis elliptica, n. sp. *C. cuneata* var. *elliptica*, Ridl.

Shrubby, stem rather slender. Leaves membranous, not fleshy, elliptic apex caudate, acuminate base narrowed decurrent on petiole, nerves 11 pairs 4.5 in. long, 1.5 in. wide. Peduncle 1.5-2 in. long, terminal and axillary. Flowers not seen. Fruit oblong, rounded at tip and base with a strong rib on each side .4 in. long, .3 in. wide (dry).

PAHANG, Telom (*Ridley* 13636).

I have not seen flowers of this plant but the foliage in texture and shape is very different from any other species and the fruit is much less pulpy.

Cephaelis triceps, n. sp.

About a foot or more tall. Leaves somewhat or very unequal in size, rather fleshy, membranous, elliptic, shortly blunt acuminate, base shortly cuneate, nerves about 12 pairs, slightly prominent beneath, 5.5 to 6 in. long, 2.1 in. wide, petiole not

winged .5 in. long. Stipules coriaceous connate with short ovate points .25 in. long. Peduncle 1.75 in. bearing 3 pedunculate heads, peduncles thick .5 in. long. Involucral bracts coriaceous connate, boat-shaped, acuminate, involucre 1 in. across. Bracts of heads broad, oblong .5 in. Heads .5 in. across of few flowers. Calyx .2 in. long, limb cup-shaped, entire. Buds subglobose. Corolla tube cylindric .25 in. long.

SELANGOR; Sempang mines, Semangkok about 3,000 ft. (Ridley).

This is very distinct from any other of our species in the 3 peduncled heads on a common peduncle.

Cephaelis elongata, n. sp.

Stem woody 14 in. tall, rather slender, internodes 1.5 in. long. Leaves narrow lanceolate, long, acuminate, base narrowed, slightly fleshy, membranous, nerves faint 8 pairs, 4-5 in. long, 1 in. wide, petiole winged .1 in. long. Stipules ovate lanceolate, blunt, connate .1 in. Peduncle .4 in. long. Heads .25 in. across of 5 or 6 flowers and 2 lanceolate bracts .25 in. long. Floral bracts ovate, boat-shaped, blunt, .12 in. long. Flowers nearly sessile. Calyx cup-shaped, entire, .05 in. long. Corolla tube cylindric, dilate at mouth .3 in. long, lobes ovate lanceolate acute .1 in. long. Fruit oblong .2 in. long 4-ridged crowned with the calyx.

SELANGOR, Semangkok Pass. (Ridley).

COMPOSITAE.

Erigeron sumatrense, Retz. Obs. v. p. 28. The plant formerly identified for me at Kew as *Conyza semipinnatifida*, Wall. (Journ. Roy. As. Soc. xlix, p. 18). I find on comparison does not belong to that species, but is an *Erigeron* allied to *E. linifolius*, Willd. a plant of unknown origin, to which it has also been referred, but it more distinctly fits the description of *E. sumatrense*, Retz., only known from his description however. It is a hairy weed from 3-6 feet tall. Leaves membranous lanceolate strongly sparsely toothed, gradually narrowed to the base of the petiole 3.5 in. long and .5 in. across. The upper leaves among the inflorescence-branches are linear 1 in. long .05 in. wide and entire. All are coarsely white; hairy. The terminal panicle is large, much branched and hairy. Heads in flower .1 in. long, yellowish on pedicels .25 in. long in fruit they are .4 in. across. The involucral bracts very narrow, hairy and shorter than the white pappus. The outer flowers are very narrow, 2 lipped with 2 minute staminodes quite sterile. The inner (disk) flowers tubular, whitish green, lobes acute, short sepaline hairs as long as the tube, anthers projecting brown-yellow turning brown after fall of pollen.

It is a common weed in clearings, in SINGAPORE, JOHOR, PAHANG, MALACCA, SELANGOR, PERAK, DINDINGS and PENANG and also occurs in SIAM, JAVA and the PHILIPPINES at Benguet (*Loher* 3615).

It is known as Sari Bulan and Snmbong Jantan.

***Erigeron oreophilum*, n. sp.**

A simple unbranched leafy herb, 6-8 inches tall softly pubescent. Leaves oblong lanceolate entire obtuse (the upper ones smaller and narrower and acute and narrowed to the base of the petiole .4 in. long .12 in wide or less, all white, hairy. Heads racemose or with 1 or 2 short branches at the base of the raceme .1 in. long in flower .20 in. across in fruit, on short slender peduncles .12 in. long. The involucre bracts very narrow linear acuminate pubescent or glabrous, not imbricating. Outer florets with a minute oblong ligule. Achene unripe glabrous pappus white.

PERAK, Gunung Kerbau at 6,600 ft. (*Robinson*).

Referred by me formerly to *E. linifolius*, but the foliage will not suit that plant as it seems to be always entire, and I do not think it can be a mountain form of that. It does not appear to be closely allied to any other species.

VACCINIACEAE.

***Vaccinium ardisiflora*, Ridl.** I find that *V. ardisiflora* is a name already occupied and substitute *V. ardisiflora* for it.

***Vaccinium loranthifolium*, n. sp.**

A stunted tree with thick black branches. Leaves stiff coriaceous obovate rounded narrowed to petiole, gland dotted beneath, nerves obscure 3 pairs rising from the midrib 2-2.75 in. long, 1-1.35 in. wide, petiole thick .2 in. long.

Racemes thick subterminal 2.5 in. long, rachis red. Flowers close-set, on very short curved pedicels. Bracts (caducous) oblong obtuse broad .2 in. long. Calyx cupular pubescent with broad ovate lobes. Corolla fleshy globose ovoid glabrous outside, hairy within. Stamens 10 short, filaments very short, hairy, anthers short, tubes nearly as long as anther cylindric, no dorsal or basal appendage. Style little longer than the stamens, thick, glabrous. Fruit fleshy, subglobose terminated by the broad calyx lobes .15 in. long, on short thick pedicel .1 in. long.

PERAK: Gunung Kerbau 4,500 ft. (*Robinson*) at 7,000 ft. (*Aniff*).

Allied to *V. viscidifolium*, King and Gamble but with much larger fruit with large sepals, and a larger ovoid fleshy corolla.

V. Teysmanni, Miq. Fl. Ind. Bat. n. p. 1062. The plants referred to this species by King and Gamble, cannot I think be this Javanese species, which was ovoid, not cylindric corollas. I propose the name of *V. perakense* for the plant so described by King in the Materials.

Vaccinium Wrayi, n. sp.

A tree. Leaves small elliptic slightly narrowed at both ends stiffly coriaceous, nerves faint but visible when dry as are reticulations, 6 pairs, 1.25-2 in. long .75-1 in. wide, petiole thick .1 in. long. Racemes 3 inches long, flowers scattered, all puberulous. Pedicels decurved .15 in. Calyx flat saucer-like with 5 large triangular lobes spreading. Corolla reddish pink, conoid-cylindric .15 in. long puberulous outside, hairy within, lobes short, rounded. Stamens very short, filaments very short with long hairs. Anthers small ellipsoid, the tubes short curved forwards, shorter than anther, a dorsal filiform process on the back of the anther. Style shorter than the corolla, little longer than the stamens pubescent. Disc hairy. Fruit globose minutely puberulous disc short hairy hemispheric. Sepals as long as disc, acute.

PERAK: Camp on Ulu Batang, Padang 4,900 ft. (*Wray* 1528). "Tree, flower reddish-pink, fruit green, leaf-stalks crimson."

Erroneously referred to *V. bancanum*, Miq. by King, which it is perhaps allied to as it has the same peculiar trumpet-shaped spurs to the anther. In all other points however, it is quite different.

Vaccinium Kunthii, King, appears to me to be a form only of *V. bancanum*, Miq.

MYRSINEAE.

Ardisia singaporensis, n. sp.

A small tree. The young parts densely red scurfy. Leaves thinly coriaceous elliptic lanceolate acuminate acute base narrowed edge slightly wavy closely gland-dotted, glabrous above scurfy beneath chiefly on the midrib on young leaves, nerves about 18 pairs fine and inconspicuous, secondary nerves nearly as conspicuous 4.5 to 7 inches long, 1.5-2 in. wide, petiole .5 in. long. Panicles in terminal axils scurfy, of several umbels on peduncles 1 in. long, secondary peduncles .5, pedicels .2 dilate upwards. Flowers bright pink .1 in. long. Buds ovoid. Calyx and lobes small oblong ovate scurfy. Corolla lobes ovate acute glabrous. Drupe globose .2 in. through, black.

SINGAPORE. Pulau Ubin (*Ridley* 2816) Changi Road (*Ridley* 2833).

This pretty tree was by some error referred by numbers at least to *A. villosa* by King and Gamble. It is most nearly allied to *A. ferruginea*, Mez. of Johor, and to *A. Miqueliana*, Teyssm. but the leaves are larger and narrowed to the base.

SAPOTACEAE.

***Palaquium calophylloides*, n. sp.**

A big tree 50 to 60 feet tall. Leaves stiffly coriaceous obovate, shortly blunt acuminate base cuneate, nerves very fine and inconspicuous about 10 pairs, nearly parallel horizontal forking at the tips, the secondary nervules and reticulations as visible, midrib flat above strongly elevate acute beneath 4 inches long and 2.5 in. wide, petiole 1 in. long thickened and rugose at base. Flowers in fascicles of 3 or 4 on tubercles on the branch below the leaves, pedicels thick .25 in. long pubescent. Calyx-lobes .4 in. long, outer three ovate, rounded finely hairy, inner ones narrower, shorter lanceolate subacute. Corolla .2 in. long, lobes oblong lanceolate subacute, tube much shorter, all glabrous. Style a little longer than the petals.

KEDAH: Kedah Peak at 1,000 ft. (*L. M. Bell and Mhd. Aniff*).

This differs from *P. Ridleyi*, King and Gamble in the faint obscure nerves and the two pairs of calyx lobes being dissimilar. The pedicels are also thicker and the corolla tube very short. The set of *Palaquiums* to which this species belongs are generally very scantily represented in herbaria on account of the immense height of the trees usually 80 ft. to the first branch and the small inconspicuous flowers. They include *P. bancanum*, *P. Ridleyi*, *P. Harceyi* and *P. microphyllum*.

***Payena lanceolata*, n. sp.**

A tree. The branchlets petiole and midrib in young leaves red tomentose. Leaves thin coriaceous lanceolate shortly cordate acuminate base narrowed drying pale greenish, nerves very fine 11-12 pairs, horizontal with the reticulations conspicuous below, midrib prominent 3 in. long, 1 in. wide, petiole slender 1 in. long. Flowers in fascicles of 2-4 in the leaf axils, pedicels stout .5 in. long, minutely pubescent. Calyx glabrous outer lobes .2 inches thick ovate blunt, inner valvate not meeting, edge ciliate. Corolla .5 in. long, tube as long as the calyx, lobes oblong rounded, blunt. Filaments very short 18, anthers conic ovate, appendage very short, hairy. Style and ovary glabrous. Style .4 in. long.

KEDAH, Lankawi on Gunong Raya (*Aniff*).

Allied to *P. turida*, but the leaves are very narrow more stiff exactly lanceolate, and flowers nearly glabrous.

***Payena utilis*, n. sp.**

A very large tree. Leaves small oblanceolate tip round or blunt-pointed, base long narrowed thinly coriaceous drying green, shining above pale beneath, nerves 8 pairs, faint but visible above and midrib elevate beneath, broad, flat above 3 in. long, 1-1.5 in. wide, petiole slender 1 in. long glabrous or with a few red hairs. Flowers numerous in the uppermost leaf axils forming a subterminal tuft, pedicels slender, glabrous or sparsely pubescent. Calyx subcylindric, lobes lanceolate blunt and narrow, pubescent .25 in. long, inner pair oblong and narrower. Corolla-tube cylindric .25 in. long hairy inside, lobes linear narrow blunt, recurved shorter than the tube. Stamens 16 filaments long slender exsert as long as the lobes, anthers linear-oblong, appendage minute. Seed very large 1.5 in. long 1 in. wide, .5 inches through, elliptic base round tip subacute yellow-brown, hilum half the width of the seed.

The "Betis" or "Bilian" of the Malay Peninsula (not of course The Borneo Bilian) I partly described this in the Agricultural Bulletin, vol. v, p. 39, but at that time had only leaves and seeds. In the Kew Herbarium are specimens with flowers from Ulu Selangor collected by Mhd. Hashin for the Forest Department.

OLEACEAE.***Linociera spicifera*, n. sp.**

Tree. Bark of branches white. Leaves coriaceous elliptic abruptly acute acuminate base shortly cuneate, nerves 7-8 pairs faintly depressed above, slightly elevate beneath, marching at apices, midrib prominent on both sides 4-4.5 in. long, 1.5 in. wide, petiole .15 in. long thick pale papillose. Flowers sessile in short racemes .24 inches long with persistent coriaceous ovate bracts. Calyx campanulate with 4 very short rounded lobes. Corolla tube very short, lobes narrow linear .25 in. dilate at base, narrowed upwards and edges incurved. Stamens, anthers ovoid obtuse with very short filaments, ovary oblong with a sessile stigma.

SELANGOR: Rawang, Forest reserve (*Kloss*).

***Linociera parvifolia*, n. sp.**

Apparently a glabrous bush with strict black branches. Leaves coriaceous lanceolate or subrhomboid or oblanceolate blunt, midrib depressed above, elevate beneath, nerves about 6 pairs, very fine almost invisible above and faint beneath, 1-1.75 inches long, .5-7.5 in. wide, petiole slender .12 in. long. Vines pinnated base spreading .5 in. long, flowers in threes at the end of branches, pedicels .1 in. long. Calyx shortly cup-shaped with 4 small ovate teeth. Corolla .1 long tube

very short, lobes 4 ovate triangular, blunt. Stamens 2, oblong with very short filaments. Ovary conic with a short style and small capitate stigma.

SELANGOR: Gunong Mengkuang at 5,000 ft. (*Robinson*).

APOCYNACEAE.

***Alstonia micrantha*, n. sp.**

Branches slender. Leaves opposite, coriaceous oblong abruptly short, candate, base shortly cuneate, nerves very fine parallel very numerous, secondary ones as conspicuous joining in a fine intramarginal vein close to the edge 4-4.5 in. long, 1.5-1.5 in. wide, petiole .25 in. long. Panicles axillary slender 3 inches long, branches distant 3 or 4, about an inch long either bearing at the tip secondary branches or simple umbellate with numerous small flowers, very shortly pedicelled. Bracts small, ovate. Calyx-tube very short, campanulate lobes rounded, ciliate. Corolla .05 in. long, tube cylindric slightly dilate in the middle, lobes oblique, oblong lanceolate more than half as long as tube, glabrous (apparently pink) 5 oblong scales deflexed in mouth of tube. Stamens just below the mouth 4, anthers ovate lanceolate shortly sagittate and filaments short. Disc thin, flat annular undulate. Ovary simple conical, glabrous, style very slender cup-shaped.

SELANGOR: Rantan Panjang (*Kloss*).

***Microchites*.**

In King's and Gamble's description of this genus in the *Materials* p. 504, two species are given, viz. *M. polyantha*, Miq. and *M. elliptica*, Hook. fil. Of the latter the Malay form is given as a variety *Scortechinii*, based on a plant of which I have only seen a poor specimen. It seems however, to be quite different from the Himalayan species *M. elliptica* and so I separate it as *M. Scortechinii* both leaves and flowers are considerably bigger than in *M. elliptica*. *M. polyantha*, Miq. as described by King and Gamble appears to comprise at least 3 species exclusive of the true plant of Miquel.

***M. furcata*, Ridl. n. sp.**

A rather stont climber, stems slightly angled. Leaves chartaceous, coriaceous elliptic or elliptic lanceolate, bluntly acuminate, base narrowed, nerves 14-18 pairs, secondary nerves nearly as conspicuous, all fine, slightly elevate inarching close to the edge, reticulations fairly conspicuous 3.5-5 in. long, 1.5-2 in. wide, petiole .25 in. long. Cymes axillary and terminal on the lateral branches, when fully developed about 2 in. long and about 1-2 in. wide, dense-flowered, peduncles and branches angled, glabrous, terminal branches pubescent.

Flowers cream-color, nearly sessile. Bracts ovate dense (red-dish) pubescent. Calyx-tube narrow, campanulate, lobes ovate lanceolate, .1 in. long. Corolla urceolate or obovoid with rather long unequally bilobed lobes, lobules linear obtuse all glabrous, anthers acuminate. Ovary densely villous with low lobed saucer-like disc. Style short. Follicles unripe linear acute terete, 6 m. long.

PERAK: Relau Tujor (Hray 2604) overhanging Bernam River (Kunstler 8859).

This certainly has the habit of the Javanese *M. polyantha* Miq., but the leaves are broader, and more coriaceous, the inflorescence denser; the calyx very much larger with broader lobes and the petals bilobed not entire.

***Micrechites brachypetala*, n. sp.**

A rather slender woody climber. Leaves thinly coriaceous obovate bluntly short acuminate, base shortly narrowed, nerves 7-8 pairs, reticulations fine, close, 2.5 m. long, 1.5 in. wide; petiole .25 in. Panicles terminal 2.5 in. long subglabrous, the branches in pairs 1 in. long, branchlets .5 in. long again branched lax, final branches .1-2 m. long with several pairs of persistent bracts whence flowers have fallen. Calyx cup-shaped with very short teeth slightly pubescent. Corolla cylindric urceolate, lobes very short, tooth-like, entire straight.

PERANG: Penara Bukit (Curtis 850).

***Micrechites tenuifolia*, n. sp.**

Straggling climber. Leaves rather thin almost membranous broadly elliptic, lanceolate, narrowed to both ends, tip blunt, base subacute, nerves very fine about 10 pairs, 2 m. long, 1.5 m. wide, petiole slender .3 m. long. Cymes small about 1 inch long, axillary and by fall of the leaves in a lax simple panicle of short distant branches, 1-6 in. long, branches puberulous. Bracts ovate, acute persistent as in preceding. Calyx lobes ovate-round puberulous. Corolla glabrous .05 in. long, tube cylindric, lobes short oblong linear, entire.

MALACCA: (Mainingay). SELANGOR, Ginting, Bidai (Ridley 7142) and Kwala Lumpur (Ridley 1857, 1905).

Like the last but calyx lobes rounded, corolla lobes much larger, leaves smaller thin.

ASCLEPIADACEAE.

***Dischidia fruticulosa*, n. sp.**

Epiphytic shrub. Stem stout, woody over .12 m. through base, swollen, branches slender, herbaceous, light green. Leaves when dry rather thin texture elliptic obtuse, narrowed to the base slightly, nerves invisible 2-3 in. long, .55-1.10 m. wide, petiole .1 in. long. Racemes sessile solitary or in pairs

lengthening to .5 in., .05 in. thick. Pedicels very short. Calyx lobes oblong, ovate, blunt. Corolla base of tube subglobose abruptly narrowed into a cylindric tube above, .1 in. long, lobes short, acute fleshy, with a deflexed tuft of hairs between each at its base. Coronal scales, claw linear, limb broad hastate round at the top. Stamen column thick, short, appendages blunt, rather thick. Pollinia oblong with short caudicles and a linear oblong carrier rather large.

PERAK: Gunong Kerbau at 4,200 ft. (*Robinson*).

I do not know any *Dischidia* as woody a shrub as this, the stem being quite stout with grey bark, the branchlets light green and herbaceous. The very thick racemes are quite sessile, and floriferous from the base, the flowers falling off as the raceme grows.

Dischidia rosea, Ridl. Journ. Roy. As. Str. Br. p. 31.

I find Schlechter has used this name for a Philippine plant a few years earlier. I therefore substitute the name *rhodantha* for *rosea*.

Dischidia astephana, King and Gamble. This plant is described as having white flowers, mainly on the strength of this apparently. Schlechter described his *Conchophyllum angulatum* as a distinct plant with red flowers. As a matter of fact the flowers are sealing-wax red entirely, except the spaces between the prominent ridges which are blue black.

Dischidia nummularia, Br. Prodr. Fl. Nov. Holl. i. p. 161. On examining the type of this plant and the excellent original drawing of J. Miller in the British Museum Herbarium it is difficult to imagine how this plant could have been confused with the common Malayan plant so identified by most botanists to the present day. The true plant has ovate flat leaves somewhat like those of *albida* of Griffith, considerably larger umbels of white flowers tipped with yellowish apparently (certainly not scarlet as given by King and Gamble). It is confined as far as I know to North Australia. The leaves of the Malayan Peninsula plant are about a quarter of the size, elliptic to ovate in outline, very fleshy nearly as thick as they are wide, glaucous and mealy, usually yellow. The flowers are white, fewer and small than in *nummularia*. The plant seems to be quite identical with *D. Gaudichaudii*, Deene, and occurs through the Malay Islands to Amboyna, and all through the Malay Peninsula to Tenasserim.

LOGANIACEAE,

***Fagraea* (Cyrtophyllum) caudata**, n. sp.

A tree thirty feet tall, branches slender. Leaves coriaceous lanceolate caudate, base narrowed to the petiole and de-

current thereon, nerves about 4 pairs widely anastomosing .05-.1 from the edge, slightly elevate beneath and nearly or quite invisible above, midrib sunk above, raised beneath, 4 in. long, 1 in. wide, petiole .5 in. long. Inflorescence axillary in upper axils and lower down, peduncle very slender 2 in. long bearing 3 flowers on pedicels as long and as slender. Calyx small .12 in. tube very short, lobes ovate subacute. Corolla yellow, tube narrow cylindric .4 in. long, limb .5 across, lobes ovate, rounded, .2 in. across. Stamens exsert about .4 in. beyond corolla. Style from base 1 in. long, filiform. Stigma small capitate.

BORNEO, Lobb 1853 in Herb. Kew. "Tree 30 feet, yellow."

This species is allied to *F. Wallichii* of Penang Hill, differing in the more coriaceous lanceolate cordate leaves, and extremely slender peduncles and pedicels, cylindric corolla tube and shorter stamens. It would probably be best to keep up the genus *Cyrtophyllum* for the Tembusu trees, which differ so much from the epiphytic true *Fagraea*s with their fleshy leaves and flowers, and included stamens, from the tall trees with their leaves and flowers and long projecting stamens. The genus *Cyrtophyllum* would thus contain *C. fragrans*, Malay Peninsula to S. Siam and Cambodia, *C. giganteum*, Malay Peninsula and Sumatra, *C. Wallichii*, Penang, *C. caudatum*, Sumatra and Borneo, *C. speciosum*, Bl., Java and Borneo. This however, has much smaller flowers and thicker leaves.

***Fagraea gigantea*, Ridl.** *F. speciosa*, Ridl. Journ. Roy. As. Soc. S. Br. 50, p. 122 not of Blume.

Since writing my account of the Tembusu *Fagraea*s in Journ. Roy. As. Soc. Str. Br. vol. 50, I have seen at Kew specimens of the true *F. speciosa*, Bl. agreeing entirely with Blume's figure in Rumphia. It is quite a different plant from our Tembusu tembaga which is confined to the Malay Peninsula and Sumatra. This plant is unnamed, and I therefore give it the name of *Fagraea gigantea* on account of the great size to which it attains. It is fully described in the Journal at the page quoted.

***Gaertnera acuminata*, Benth.** Journ. Linn. Soc. i p. 112 was based on a plant collected by Wallich in Singapore (No. 8342). It was reduced to a variety of *Koenigia* of Ceylon, a much larger plant, with large leaves and flowers, by Clarke and following him by King and Gamble. It is obviously a different plant and I retain the name *acuminata* for it. Wallich also (8344) got a somewhat different looking plant narrower leaves in Singapore which he called *Psychotria oxyphylla*. Bentham separated this also into a distinct species *G. oxyphylla*.

It seems however, to pass into *G. acuminata* and had better perhaps be kept as a variety of that species. Besides these lowland plants we have a whole series of specimens from our mountain regions which differ in their more compact habit, more coriaceous leaves, dense cymes and short, thick pedicels. They seem to be mountain forms of *oryphylla* and could be classed as sub var. *Montana*. An allied plant which was obtained by Mr. Robinson on Tampin hill, differs in having the flowers sessile in small heads, and a truncate corolla. This I propose to separate under the name of *G. sessiliflora*.

Gaertnera sessiliflora, n. sp.

A glabrous shrub. Leaves chartaceous, lanceolate acuminate, cuspidate, long narrowed at the base, nerves 7 pairs, slender, elevate beneath 4.5-5.5 in. long, 1.10-1.25 in. wide, petiole .1 in. long. Stipules forming a tube with 2 setaceous points .5 in. long. Cymes 3 of about 6-10 sessile flowers in dense heads .2 in. long, peduncle thick, .3 in. long. Bracts at base of peduncle ovate, long—setaceous. Calyx campanulate limb truncate entire .05 in. Corolla .24 inches long, tube cylindric, lobes as long, round, ovate mouth very woolly. Fruit globose 2-seeded .3 in. through.

NUEH SEMBILAN, Tampin Hill (*Robinson*).

Gaertnera pedicellata, n. sp.

Slender shrub. Leaves lanceolate cordate acuminate long, narrowed to base, nerves slender 4-6 pairs 3-3.5 in. long, .5 in. wide, petiole .6 in. long, slender. Stipules .25 in. long, tubular with short setaceous points. Cymes terminal lax spreading sessile 1.5 in. long, branches few .5 in. long bearing one to three flowers, pedicels .25 in. long. Calyx wide campanulate .06 in. long, truncate. Corolla 4 in. long, tube rather stout, lobes elliptic, obtuse .15.

SELANGOR: Gunong Mengkuang Lebar (*Robinson*).

This is a slender shrub with a short lax paniced cymes and much longer pedicels than any form of *G. oryphylla* and longer petioles.

PONTEDERIACEAE.

Monochoria elata, n. sp.

An aquatic plant 6-8 feet tall, stem thick. Leaf petiole 24 in. long, blade hastate, linear 4 in. long, .3 in. wide slightly narrowed to the tip. Lobes at base linear acuminate blunt 1 in. long. Sheathing leaf of inflorescence with a sheath 3 in. long over 1 in. wide, petiole 6-7 in. long, blade spear-shaped 2 in. long, .1 in. wide, base slightly broader, cuneate. Raceme many flowered 3.5-5 in. long. Pedicel slender .4 in. long.

Flowers blue. Sepals and petals .75 in. long, .2 in. wide lanceolate acuminate, petals a little the larger. Stamens 6, filaments rather slender, anthers linear, blunt .2 in. long. Ovary conic passing into the rather stout style. Fruit I have not seen ripe but it appears to be small and oblong. *M. coccinialis*, Prest. var. Mohammed Haniff in Gardens Bulletin i, 1916, p. 354-355.

KIDAY: Jenun, common in rice fields, flowers blue 6-8 feet high (*Mohammed Aniff*) 1208.

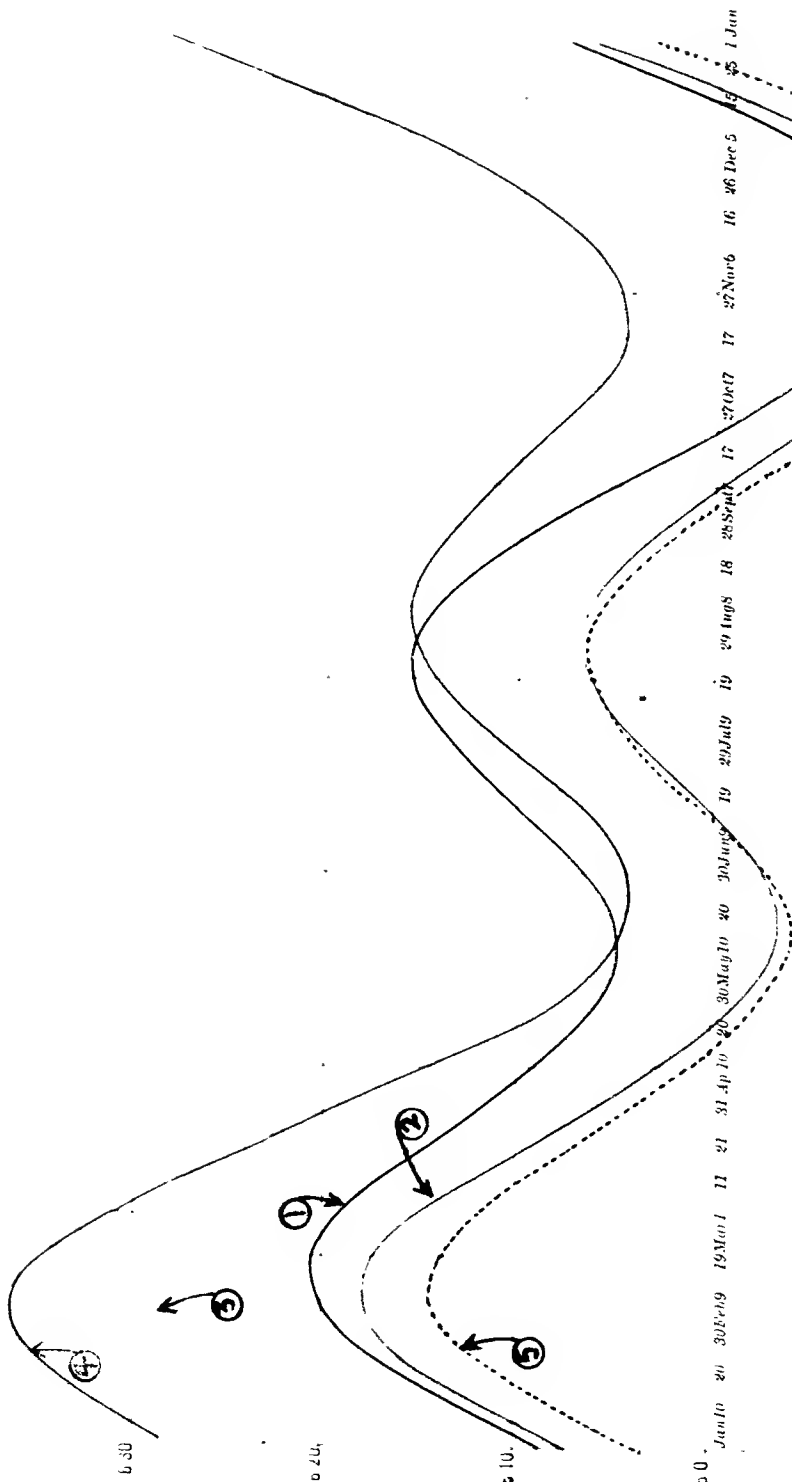
In its great height and narrow hastate leaves and raceme this differs from any of the few species of this genus. The only plant at all resembling it is an undescribed species from Port Darwin in Australia collected by Mr. C. E. F. Allen, which may be named as follows:—

M. australasia apparently a submersed plant about 18 inches long. Leaves linear 18 in. long, .15 inches wide. Raceme in the axil of a pair of sheathing leaves, sheath 3 inches long, .6 in. wide, blade linear acuminate, not petiolate nor hastate 1.5 in. long, .1 in. wide. Flowers scattered about 8, blue, pedicels .1 in. long. Sepals and petals oblong lanceolate, narrowed to the tip .4 in. long, .2 in. at base. Stamens short, oblong .05 in. long, blunt at both ends, yellow. Capsule ellipsoid, .5 in. long, .25 in. through, acuminate. Seed oblong, truncate, black with 15 fine ribs running from top to base .65 in. long.

NORTH AUSTRALIA: near Darwin S. (C. E. F. Allen, Nov. 1914.)



b. 40.



- ① SINGAPORE SETTING
- ② RISING
- ③ PENANG SETTING
- ④ RISING
- ⑤ EQUATION OF TIME

Time of Sunrise and Sunset at Singapore and Penang throughout the Year.

BY H. MARRIOTT.

Accompanying this note is a chart showing the times of sunrise and sunset at Singapore and Penang throughout the year.

Each space on the chart represents horizontally an interval of five days and vertically one minute.

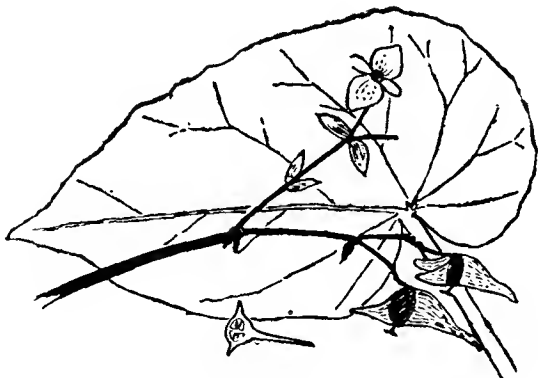
A dotted curve shows the 'equation of time' (*i.e.* the difference between apparent solar time as indicated by a sun-dial and mean-time as recorded by the clock). Bearing in mind that by using the standard time of the 105th degree of longitude instead of that of our own longitude of $103^{\circ} 50'$, our clocks in Singapore are 4 minutes 40 seconds ahead of the true time, this dotted line shows how very small is the variation due to our small northern latitude. In Penang the corresponding amount of 'daylight saving' is 18 minutes 36 seconds, but in addition there is quite an appreciable variation on account of latitude. In Singapore the difference between the lengths of the longest and shortest days in the year is only about 9 minutes, in Penang the difference is $36\frac{1}{2}$ minutes. At both places there are two maxima and two minima in the curves, but while in Singapore the longest evenings are in February and are entirely caused by the 'equation of time,' in Penang the effect of latitude is sufficient to make the evenings longer in July than in February.

The times calculated are the Singapore standard times at which the centre of the sun's disc is visible on the horizon to an observer at the sea level, allowance being made for the fact that owing to refraction the sun is visible when in reality it is $36'$ below the horizon.

Begonia Haniffii, a small tuberous species of the Islands of Lankawi.

BY I. H. BURKILL.

In 1896 Mr. Curtis obtained at Kasoom in the Siamese Malay States a tuberous *Begonia* which Mr. Ridley described in this Journal (No. 50, 1911, p. 106) as *Begonia Curtisii*. The new species here to be described is its counterpart from the islands of Lankawi. Both Kasoom and Lankawi are limestone regions, and both *Begonias* grow on the limestone rocks, dying down before November and surviving to February, when they sprout, by underground tubers.



Begonia Haniffii was obtained some five years ago by Mr. Mohamed Haniff, and brought into the Waterfall Gardens, Penang, where it persists. From the underground tuber it attains a height at about eight inches; if a weak plant it may have one stem only; if a strong plant it may have up to six. These stems carry 2-4 leaves of which the largest appears to be one with the cordate half to the right of the midrib. The leaves in outline are as drawn here; they are of a dark green thickly covered with small silvery spots, each spot a patch of 40-100 air-containing cells often but not always around the base of a short air-containing hair. Such spots in this species often touch the larger veins. The stem is slightly translucent, crimson, with a little entangled dark hair here and there, but chiefly below; it zigzags at the nodes. The colour, translucency and slight hairiness extend to the petioles. The stipules are pale with a little of the crimson colour along their nerves. The flowers

are segregated, the females occupying the best places, the males on lateral branches. The flowers are white with a slight amount of the crimson pigment along the veins. The male flowers may be $\frac{1}{2}$ inch across and 1 inch from top to bottom. The stamens are about 120 in a globose cluster, not having the connective extended. The female flowers are 5-merous, about $\frac{1}{2}$ in. across. The style bifurcates close to the base, and each half with a considerable amount of fullness ends in a dull yellow typically marginal stigma. The ovary has two cells with the placenta in each as two plates. The wings of the fruit outside these two cells make nearly equilateral triangles; but the unpaired wing is much elongated, and slightly hooked at the point. The surface of the capsule before maturity is somewhat mealy by reason of sloughing cells.

Begonia Haniffii, species in sectione *Platycentro*, ad *B. Curtisii*, Bidd., maxime affinis; differt praecipue fructu longo alato, et foliis magis longioribus.

Radix tuberosa. *Caules* erecti, 20 cm. alti, coccinei, hinc inde pilis fuscis tortis tecti, subtranslucetes. *Folia* tenuissime herbacea, inaequilateralia, ad 15 cm. longa, ad 8 cm. lata, 6—7-nervia dense argenteo-maculata maculis ad 2 mm. diametro, praeter pilos perparvos emortuos in medio macularum glabra; petioli ad 8 cm. longus, colore cauli similis; stipulae 10 mm. longae, ovatae ex basi lata, acutae, 5-nerves, pallidae, in nervis coccineo-tinctae. *Flores masculini* in ramis lateralibus, albi, in nervis coccineo-tincti; petala majora 10 mm. longa, petala minora 8 mm., majora ovata obtusa, minora anguste obovata. *Anthodae* circa 120, apice rotundatae. *Flores foeminei* 5-meri, albi, 10 mm. diametro. *Stylus* prope basi bifidus; rami plicati. *Fructus* ob cellulas emortuas subfarinosus, biloculatus, trialatus ala majori ad 20 mm. longa, apice fere hamata, alis minoribus subaequalateralibus 10 mm. longis. *Semina* numerosissima, pallide umbrina, angulata.

Planta haec ex vivo descripta habitat in rupibus calcareis insularum Laukawi. Folia vigescent mense Martio; caules marcent mense Octobri.

The Hindu Element in Malay Marriage Ceremony.

BY R. O. WINSTEDT.

It is well-known that a Malay raja when marrying a secondary wife of inferior rank often does not appear in person but is represented by his *kêris*. As one might expect, this would appear to be a custom of Indian origin. Among the Tottiyans a caste of Telugu cultivators, who are probably descendants of the soldiers of the Nayakkan kings of Vijayanagar—"if a man belongs to a Zamindar's family, he is said to be of the Raja Kambala caste. If a marriage is contracted with a woman of an inferior class, the bridegroom does not personally take part in the ceremony: a dagger (*kuttar*) or rude sword is sent to represent him and the *tali* is tied in the presence thereof. In a Zamindar's suit, details of which are published in the Madras Law Reports, Vol. XVII, 1894 the judge found that the plaintiff's mother was married to the plaintiff's father in the dagger form; that a dagger is used by the Saptur Zamindars who are called Kattari Kamaya, in the case of inequality in the caste or social position of the bride; that though the customary rites of the Kambala caste were also performed, yet the use of the dagger was an essential addition; and that though she was of a different and inferior caste to that of the plaintiff's father, yet that did not invalidate the marriage." (E. Thurston's *Castes and Tribes of Southern India*, Vol. VII, p. 190).

Diet Nutrition and Excretion of the Asiatic Races in Singapore.

No. 2. MANUAL WORKERS.

BY J. ARGYLL CAMPBELL.

This is the continuation of the work published in August, 1917, when the diet, nutrition and excretion of the local medical students were dealt with (1). In the present paper, manual workers are under observation.

As might be expected considerable difficulty has been experienced in obtaining material from labourers, but with the faithful co-operation of several of the medical students and of others, a number of analyses were possible. It is hoped that more will be done in the future.

METHODS.

Kidney Excretions.—The same methods were employed for the estimations of nitrogen, ammonia, urea and chloride, as those used in the previous research (1).

In addition, quantitative estimations of the phosphates and uric acid were carried out. Phosphates were estimated by titration with uranium nitrate in a solution of acetic acid, which precipitates all the phosphate. The end reaction is either the brown colour which is produced by an excess of uranium nitrate in the presence of potassium ferrocyanide or the green colour formed by tincture of cochineal with a surplus of uranium nitrate.

The Hopkins-Wörner method was used to estimate the amount of uric acid present.

Diet.—In some cases details, of the kinds and amounts of food allowed to their workers, were obtained from employers.

In other cases it was possible to weigh the food before each meal.

The compositions of the foods and their heat values have been taken from standard books on the subject (2).

VARIOUS WORKERS.

Chinese Bakers.—Two Chinese bakers, employed by the father of one of the students, supplied material for eight observations. The average figures for the kidney excretions will be seen in Table 1. The amount was scanty, 80 c.c. This was due to perspiration

whilst in the bakery. The total nitrogen was 8.3 grammes. The ammonia, 1.04 grammes, was high and therefore, so was the ammonia co-efficient, 10.3%. The reason for this is not clear. Probably further experiments will elucidate the problem. The amount of chloride was 5.1 grammes and of uric acid 0.48 gramme.

The diet consisted of rice with small quantities of pork, beef and fish.

Tamil Gardeners.—Fourteen observations were made from material furnished by two Tamil gardeners, working at the Medical School Hostel. The average amounts of kidney excretions were nitrogen 7.2 grammes, urea 13.4, uric acid 0.49, ammonia 0.13, chloride 7 and phosphate 1.25 (Table I). Their average weight was 101 lbs. and their average age 23½ years. The average diet consisted of bread 224 grammes, condensed milk 2, sugar 12, butter 13, boiled rice 1376, fish 84, green vegetables 213. This contains 76 grammes of protein, 19 of fat and 168 of carbohydrate. The heat value is 2407 kilocalories. Judging from their nitrogen excretion they metabolised only 45 grammes of protein, so that they did not metabolise all their food (Table II).

Malay Gardener.—This man worked at the school; two observations were made with his kidney excretions. His average figures were nitrogen 7.9 grammes, urea 15, uric acid 0.6, ammonia 0.61, chloride 5 and phosphate 1.5 (Table I). Rice was his chief food, but no details were obtained. He weighed 120 lbs.

Chinese Rickshaw Runner.—This runner was employed privately by the author. One specimen of kidney excretion was obtained when a full day's running (about 15 miles) was done. His figures were, nitrogen 9.8 grammes, urea 20.4, uric acid 0.54, ammonia 1.06, chloride 2 and phosphate 1.8 (Table I). His diet consisted chiefly of rice with small quantities of beef, pork and fish, but no details were obtained.

Chinese Rubber Estate Coolies.—Five weeders and tappers working on a local rubber estate, owned by a student's father, supplied material for fifteen observations. On an average they excreted by the kidney 10.4 grammes of nitrogen, which is equivalent to the metabolism of 65 grammes of protein. Their daily allowance of food contained 86 grammes of protein, 17 grammes of fat and 614 grammes of carbohydrate, the diet being rice (weighed uncooked) 728 grammes, pork 14, fat 7, fish 112, dried peas 56, green vegetables 224. This gives a heat value of 3015 kilocalories (Table II). It is evident that they did not metabolise all this allowance, only 65 out of 86 grammes of protein in the food being accounted for in the kidney excretion.

The figures for the other excretion were urea 19.4 grammes, uric acid 0.65, ammonia 1.09, chloride 6.6 and phosphate 1.78 (Table I). The average age was 32 years and the average weight 122 lbs.

Chinese Prisoners.—Six first class prisoners at the gaol were next employed, under the supervision of the assistant surgeon. They furnished material for 36 observations. Their daily diet, which is fixed by statute and which is considered to be generous for local labourers, consists of cocoanut oil 28 grammes, fresh meat (with bone) 112, rice (weighed uncooked) 448, salt 7, fish (with bone) 84, vegetables 336 and bread 112. This contains 84 grammes of protein, 50 of fat and 432 of carbohydrate, the heat value being 2580 kilocalories.

The average age of the prisoners was 40 years and the average weight 137 lbs. The average length of time on the above diet was 3 years 4 months. The prisoners were all employed in the prison kitchen. Before their confinement they were variously employed—fisherman, rubber estate coolie, tapioca estate coolie, bullock cart driver, shopkeeper and shop coolie.

The average figures for the kidney excretions were nitrogen 11.4 grammes, urea 21, uric acid 0.43, ammonia 0.15, chloride 5.5 and phosphate 1.8 (Table I).

Judging from the nitrogen excretion they metabolised on an average only 71.2 of the 84 grammes of protein of the food (Table II).

COMMENTARY.

Looking at the average figures for the kidney excretions (Table I) it will be seen that there is considerable variation for different occupations, after making allowance for the weight. The amount of nitrogen excreted per kilogram of body weight is shown in one column of Table I. The average figures usually given in text books of Physiology for Europeans in Europe are appended. These figures are the standard figures used for teaching purposes, and the figures for manual labourers in Europe are higher than these. A glance will show that the figures for the nitrogen and urea are much lower in the case of the Asiatic labourer in Singapore. This is due to the fact that he metabolises less protein than the European. He also has less energy. Our local gardeners cannot be regarded as hard workers from a European point of view. The estate coolies and rickshaw runner rank amongst our hardest muscular workers. McKay (3) has shown that a European possesses better physique and greater muscular energy than an Asiatic because the former metabolises a larger quantity of protein. Looking at Table II it will be seen that my figures support this view. The average figure for a European doing moderate labour in Europe is 125 grammes, whereas 71.2 is the highest figure obtained in my experiments with the local labourer. On the other hand the carbohydrate part of the diet is increased in amount, relatively and absolutely, in the case of the Asiatic.

Judging from the amount of protein of the diet, accounted for in the kidney excretion the calorific value of the Asiatic labourer's metabolised food (Table II) is a good deal below that of the European, allowance being made for the difference in weight,

The former does less work. Gentlemen, who have controlled labour both in this city and in Europe, have no doubt that the European labourer has better physique and is capable of heavier work than the tropical Asiatic. Undoubtedly climate plays an important part in this matter. The continuous heat and moisture of the atmosphere in Singapore, do not readily allow escape of heat from the body. Work and food increase body heat, so that the natural remedy is to lessen these. One does occasionally see coolies doing very heavy work but they do not keep this up for any length of time.

Returning to Table I, it will be observed that the uric acid, phosphate and chloride are also present in smaller quantities in the local labourer's kidney excretion than in that of the European. This is due to the fact that the diet of the former contains smaller quantities of the substances from which these are derived.

In all cases the ammonia co-efficient for the local Asiatic is higher than that of the European. This is due to the fact that the former excretes a smaller amount of nitrogen.

No reference has been made to the nitrogen excreted by the skin. This is not sufficient to interfere greatly with the results obtained.

CONCLUSIONS.

I. As far as these experiments go, the figures obtained show that on the whole the amounts of kidney excretions for local labourers differ considerably from the standard amounts given for Europeans in Europe.

II. The total nitrogen varies from 7.2 to 11.4 grammes, the urea from 13.4 to 24, the uric acid from 0.13 to 0.65, the ammonia from 0.61 to 1.09, the chloride from 2 to 7, and the phosphate from 1.25 to 1.8.

III. The local labourer uses less protein and fat, but more carbohydrate than the European. The metabolised food of the former has a smaller calorific value. Two reasons, closely connected with one another may be given for this. They live in a continuously hot and moist climate. They do less work.

The author is indebted to the following for assistance in this work—V. Gopalan, Lee Kek Soon, V. Thambar, Tham Ying Khew, H. bin Tveb and Mr. Hale, the Assistant Surgeon at the Gaol.

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Table I. — Kidney Excretions (Average figures).

Subjects	Age in Years.	Height in inches.	Weight in lbs.	Number of observations.	Total Nitrogen.	Urea.	Uric Acid.	Ammonia.	Ammonia Coefficient.	Chloride.	Phosphate. P_2O_5 .	Specific gravity.	Nitrogen per kilogram of body weight.
Two Chinese Bakers.	27.5	63	112.5	8	8.3 gm.	17.1 gm.	0.48 gm.	1.04 gm.	10.3 "	5.1 gm.	—	1021	0.169 gm.
Two Tamil Gardeners.	23.5	63	101	14	7.2 "	13.4 "	0.49 "	0.73 "	8.3 "	7.0 "	1.25 gm.	1016	0.164 "
One Malay Gardener.	45	60	120	2	7.9 "	15.0 "	0.60 "	0.61 "	6.3 "	5.0 "	1.50 gm.	1026	0.152 "
One Chinese Rickshaw Runner.	—	—	—	1	9.8 "	20.4 "	0.54 "	1.06 "	8.9 "	2.0 "	1.80 "	1019	—
Five Chinese Rubber Estate Coolies.	32	—	122	15	10.4 "	19.4 "	0.65 "	1.09 "	8.6 "	6.6 "	1.78 "	1018	0.196 gm.
Six Chinese Prisoners.	40	64	137	36	11.4 "	21.0 "	0.43 "	0.75 "	5.5 "	5.5 "	1.80 "	1018	0.192 "
European in Europe. (Standard figures.)	—	—	160	—	16.0 "	35.0 "	0.75 "	0.65 "	3.3 "	11.0 "	3.50 "	1020	0.228 "



Table II. — Diet and Metabolism (Average figures).

Subjects.	Diet.	Weight in lbs.	Protein in food.	Protein from nitrogen in urine.	Fat in food.	Carbohydrate in food.	Kilocalories in food.	Kilocalories in metabolism Ritogram of food per weight of body.	Remarks re Food.
Two Tamil Gardeners.	Mixed.	101	76	45	19	168	2407	32	Food weighed before each meal.
Five Chinese Rubber Estate Coolies.	"	122	86	65.0	17	611	3015	43	Daily food allowance.
Six Chinese Prisoners.	"	137	84	71.2	50	432	2580	36	Daily food allowance.
European in Europe.	"	160	125	125.0	125	400	3324	47	Average diet for European doing mode- rate muscular work.





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